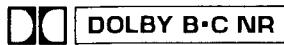


Service Manual

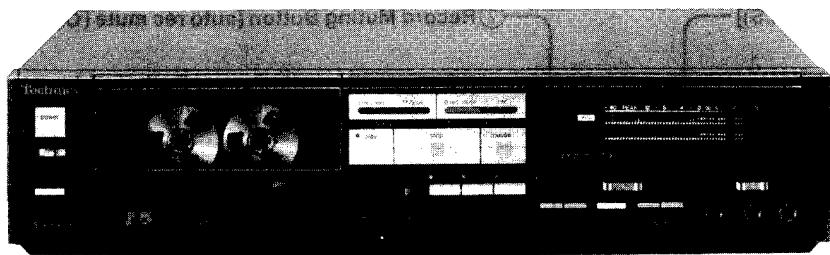
Cassette Deck

**dbx /Dolby B-C NR, Auto-Reverse
Cassette Deck**



RS-B58R

(Silver Face)
(Black Face)



This is the Service Manual
for the following areas.

D ...For all European
areas except United
Kingdom.

B ...For United Kingdom.

RS-8R MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback
Tape speed:	4.8cm/s
Wow and flutter:	0.05% (WRMS), $\pm 0.14\%$ (DIN)
Frequency response:	Metal tape; 20~20,000Hz 30~18,000Hz (DIN) 40~17,000Hz ± 3 dB
	CrO ₂ tape; 20~19,000Hz 30~17,000Hz (DIN) 40~16,000Hz ± 3 dB
	Normal tape; 20~18,000Hz 30~16,000Hz (DIN) 40~15,000Hz ± 3 dB
Dynamic range:	110dB (at 1kHz) with dbx in
Max. input level improvement:	10dB or more improved with dbx in (at 1kHz)
Signal-to-noise ratio:	dbx in; 92dB (A weighted) Dolby C NR in; 73dB (CCIR) Dolby B NR in; 67dB (CCIR) NR out; 58dB (A weighted) (Signal level = max. input level, CrO ₂ type tape)

Fast forward and
rewind time: Approx. 90 seconds with C-60 cassette
tape

Inputs:	MIC; sensitivity 0.25mV, applicable microphone impedance 400Ω~10kΩ
Outputs:	LINE; sensitivity 60mV, input impedance 47kΩ or more
	LINE; output level 400mV, output impedance 1.5kΩ or less
	HEADPHONES; output level 80mV (at 8Ω) applicable headphone impedance 8Ω~600Ω
Bias frequency:	80kHz
Heads:	2-head system 1-AX (AMORPHOUS) head for record/playback
Motor:	1-double-gap ferrite head for erasure 2 plus 1-motor system • 1-Electrical governor motor • 2-DC motor
Power requirements:	[D]...AC; 220V, 50-60Hz [B]...AC; 110/125/220/240V, 50-60Hz Pre-set power voltage 240V
Power consumption:	18W
Dimensions:	43cm(W)×9.8cm(H)×27.3cm(D)
Weight:	5kg

Design and specifications are subject to change without notice.

*The term dbx is a registered trademark of dbx Inc.

** 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

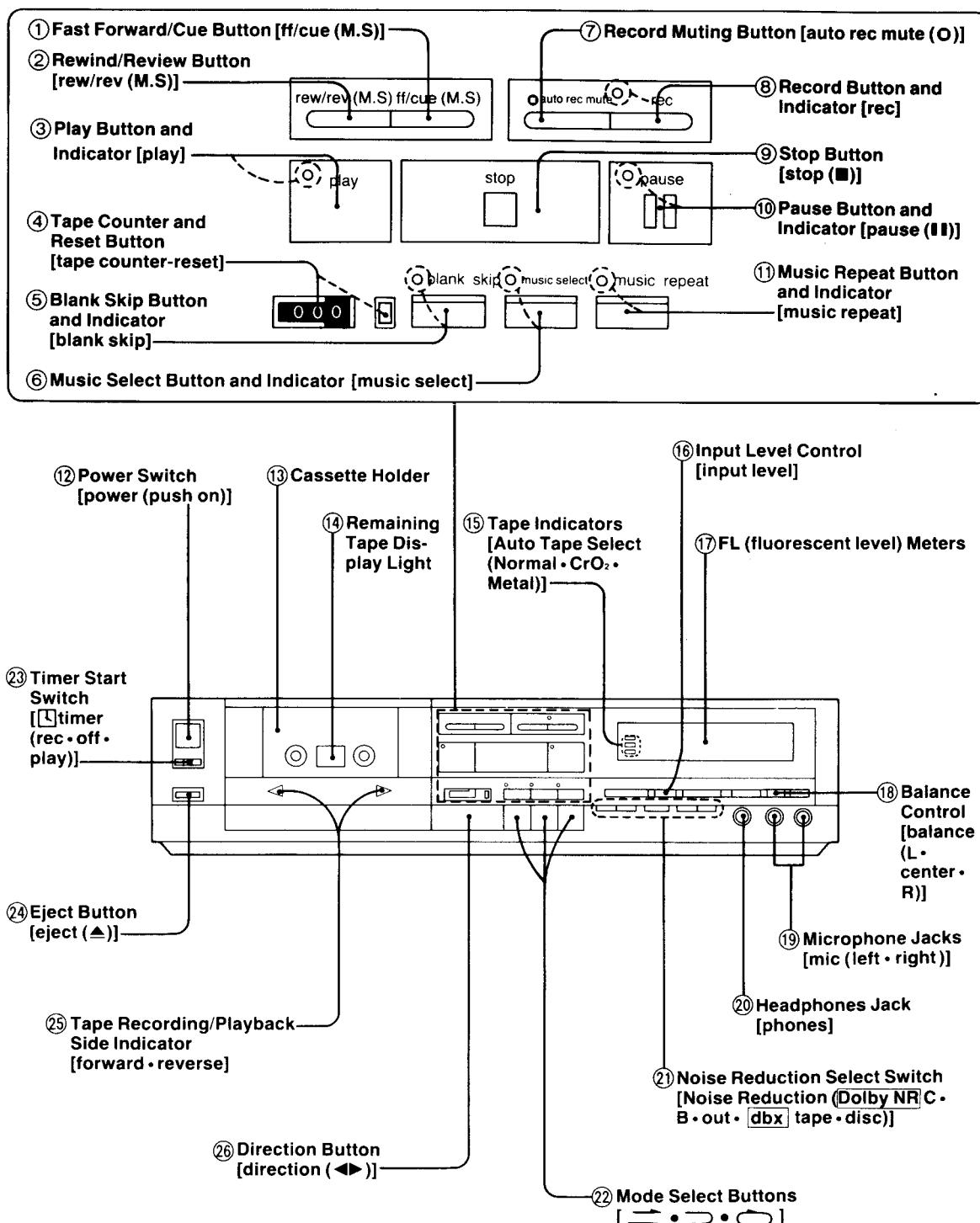
Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

CONTENTS

ITEM	PAGE	ITEM	PAGE
• Location of Controls and Components	2	• Schematic Diagram	19
• Disassembly Instructions	3	• Electrical Parts List.....	23
• Replacing Rotary Head Assembly	6	• Circuit Boards and Wiring Connection Diagram.....	25
• Measurement and Adjustment Methods	6	• Mechanical Parts Location (included Parts List)	29
• Microcomputer Terminal Function and Waveform	13	• Cabinet Parts Location (included Cabinet, Accessories and Packing Parts List)	31
• Block Diagram	17		

LOCATION OF CONTROLS AND COMPONENTS



PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

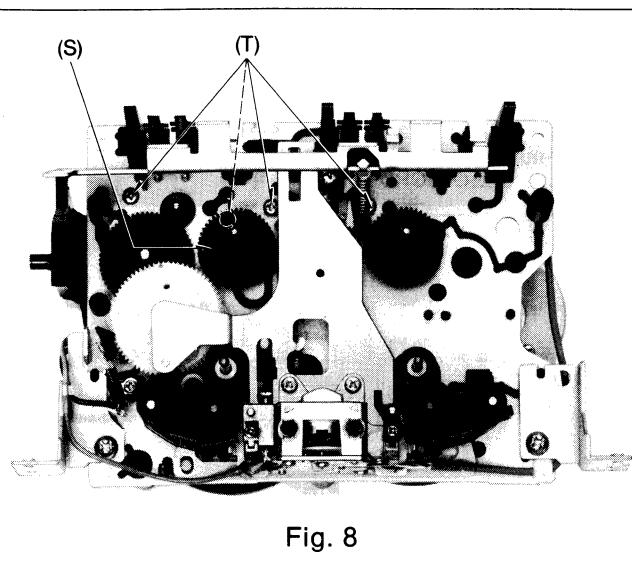


Fig. 8

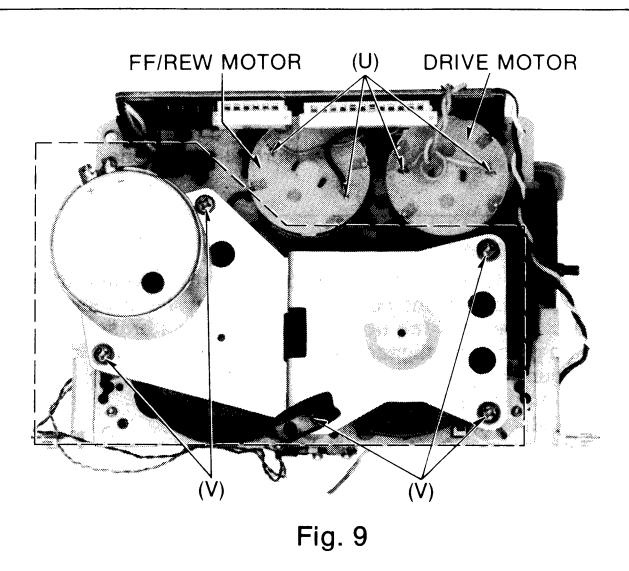


Fig. 9

Removing the Mode Select Button

The Mode Select Buttons are press-fit with the Button Bushings, as shown in Fig. 11, with the Front Panel Assembly and Button Springs between them. Remove the Button Bushings using pliers to disassemble these parts. Be careful not to lose the Button Springs as they will pop out.

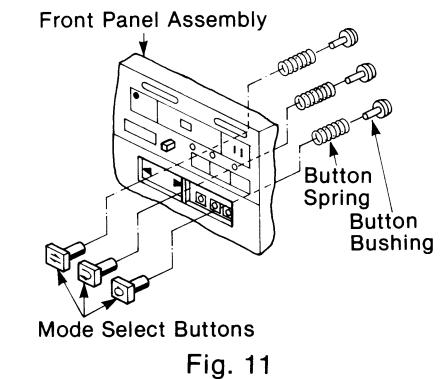


Fig. 11

Reassembling the Mechanism Unit

- For repair, measurement or adjustment with the mechanism removed from the unit be sure to ground the lower base plate of the mechanism. For grounding, connect a extension cord to the mechanism's lower base plate and the ground of main circuit board. Without grounding, the mechanism does not operate properly.
- Before attaching the Mechanism Unit to the Front Panel Assembly, thread the Counter Belt over the Reel Table (M18) and the 6-pin Jumper Socket Cover as shown in Fig. 12, and then secure the Mechanism Unit with two screws (K) (Refer to the Fig. 7.). Then, remove the Counter Belt from the 6-pin Jumper Socket Cover, and thread it over the Tape Counter Pulley as shown in Fig. 7. Make sure that the Counter Belt is not twisted.

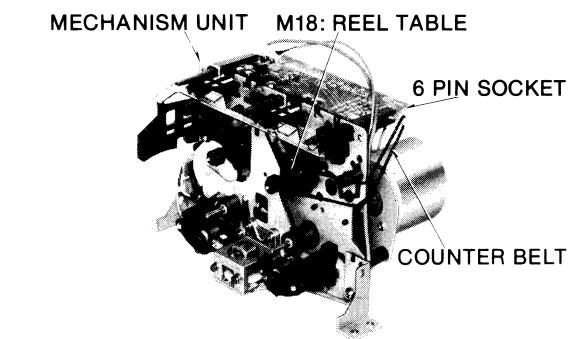


Fig. 12

PRECAUTIONS FOR PARTS REPLACEMENT

Replacement of the Blank Skip/Music Select/Music Repeat Button

The Blank Skip, Music Select and Music Repeat Buttons are a one-piece resin molded part (It is supplied as a single part.).

As shown in Fig. 1, this button is fixed in such a manner that the Front Panel Assembly is sandwiched between the Ornament Plate (G5-1) and the button (G5-2) and three pins **A** are melted by heat. (Four pins **B** are used to fix the Ornament Plate. Refer to Fig. 2.)

To remove this part, first, remove the four lugs on the Ornament Plate from the Front Panel. Then, while pulling part **C** of the Ornament Plate toward the front, heat the seven pins **A** and **B** with a soldering iron. (Refer to the Fig. 2.)

As mentioned above, this part is fixed by melting the pins by heat, both the Ornament Plate and button must be replaced when replacement is required.

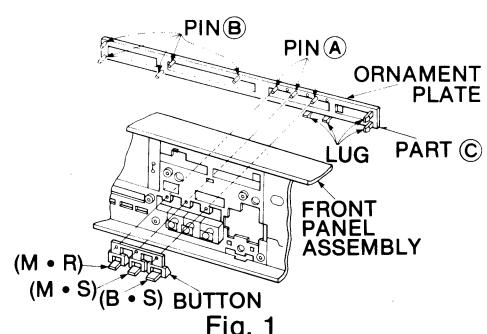


Fig. 1

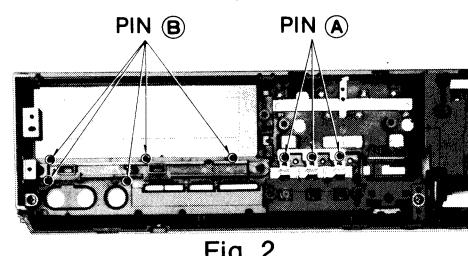


Fig. 2

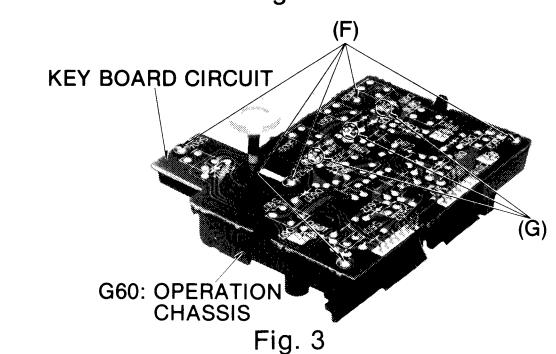


Fig. 3

Replacement of Parts on the Keyboard Circuit

To replace the parts on the keyboard circuit, first, remove the five screws **F**, and then desolder six terminals **G** of three LED's. The Operation Chassis can then be removed from the Base Plate and the parts be replaced. (Refer to the Fig. 3).

Ref. No.	Procedure	To remove —.	Remove —.	Shown in fig. —.
1	1	Case cover	<ul style="list-style-type: none"> 2 ornament screws.....(A) 3 screws(B) As shown in fig. 1, pull case cover in the direction of arrow ①. 	1 2 1
2	1 → 2	Front panel assembly and mechanism unit	<ul style="list-style-type: none"> 3 screws(E) 2 screws(F) 2 screws(G) 2 screws(H) Pull out the connectors A F G H L(I) How to remove flat cable(J) 	3, 4, 5 6 6 6 3 3
3	1 → 3	Mechanism unit	<ul style="list-style-type: none"> Push the eject button(C) Cassette lid.....(D) 2 screws(G) 2 screws(H) 2 screws(K) Counter belt(L) 	1 1 6 6 7 7
4	1 → 4	FL meter assembly	• 2 screws(M)	7
5	1 → 5	Slide volume assembly	• 2 screws(N)	7
6	1 → 6	Key board circuit	<ul style="list-style-type: none"> 2 screws(O) As shown in fig. 7, raise the clamper in the direction of arrow ② and remove the key board circuit in the direction arrow ③. 	7
7	7	Bottom cover	<ul style="list-style-type: none"> 2 screws(F) 2 screws(H) 7 screws(P) Slide the bottom cover in the direction arrow ④ and remove it. 	6 6 6 6
8	1 → 7 → 8	Main circuit board	<ul style="list-style-type: none"> How to remove nylon rivet(Q) 1 screw(E) 1 screw(R) 	3 4 3
9	1 → 3 → 9	FF/REW motor and drive motor	<ul style="list-style-type: none"> Remove the reel table(S) 4 screws(T) Unsolder the soldered portion of the FF/REW motor terminal and driver motor terminal(U) 	8 8 9
10	1 → 3 → 10	Capstan motor	• 5 screws(V)	9

REPLACING ROTARY HEAD ASSEMBLY

Considerations in mounting the rotary head assembly

1. This recorder requires a record/playback head of extremely precise head height. In replacing the rotary head, install a factory-adjusted full rotary head assembly.
[Never attempt to disassemble the rotary head assembly by removing screws (A).]
2. In installing the replacement rotary head assembly, make certain that the change gear is placed at location (B) on the change rod. (See Fig. 1.)
3. Trace the record/playback head lead-wire as follows (Refer to Fig. 2.):
 - Set the record/playback head in its forward playback direction.
 - Slacken the wire between the head assembly and the mechanism angle-R (by making a 5 or 6mm turnup).

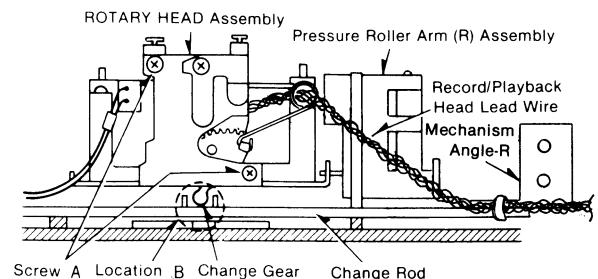


Fig. 1

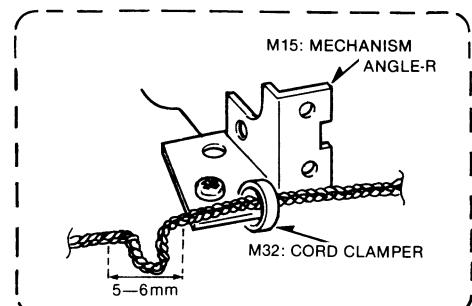


Fig. 2

MEASUREMENT AND ADJUSTMENT METHODS

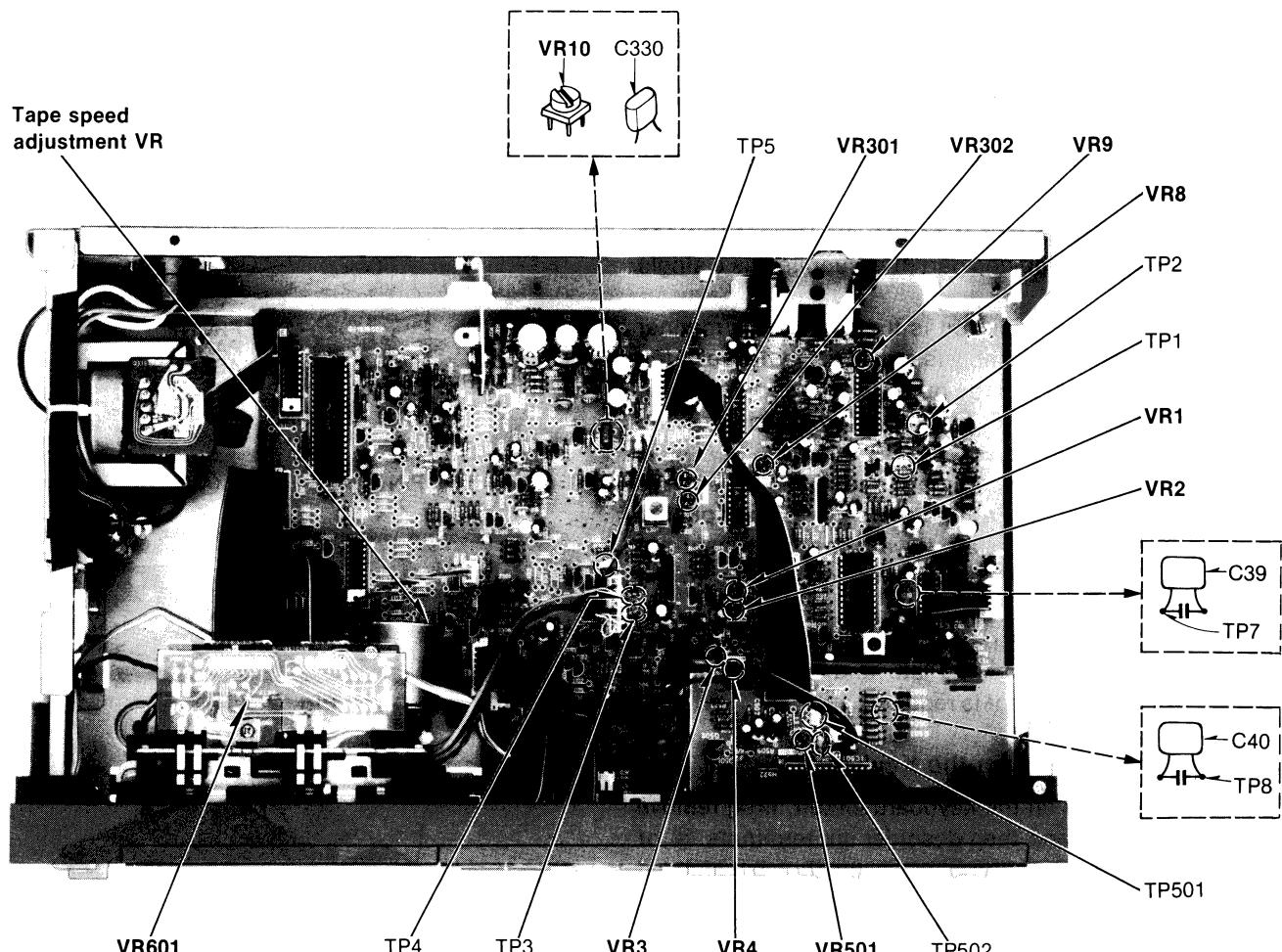


Fig. 1

NOTES: Set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean
- NR switch: OUT
- Make sure capstan and pressure roller are clean
- Timer start switch: OFF
- Judgeable room temperature $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$)
- Input level control: Maximum
- Mode switch:  mode
- Blank skip switch: OFF
- Music select switch: OFF
- Music repeat switch: OFF

A Head adjustment

Condition:
 • Playback mode
 (Forward • Reverse)
 • Normal tape mode

Equipment:
 • VTVM
 • Oscilloscope
 • Test tape (azimuth)...QZZCFM
 • Test tapeQZZCRD

HEAD HEIGHT ADJUSTMENT

1. Turn the tape guide height adjustment screw and the erase head height adjustment screw on the rotary head assembly counter-clockwise until the upper end face of the erase head and of the tape guide are aligned on the same plane as the top face of their respective guide pins. (Refer to Figs. 2, 3 and 4).
2. Put a point ink-mark on the head of each adjustment screw. 

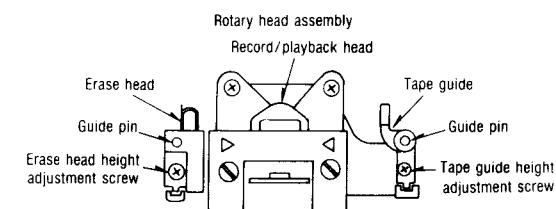


Fig. 2

3. With the marks as guides, turn the erase head height adjustment screw 3.2 turns clockwise and the tape guide height adjustment screw 2.5 turns clockwise. 

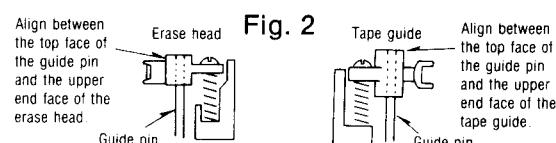


Fig. 3



Fig. 4

4. Install a test tape (tape with mirror: QZZCRD) on the recorder; place the recorder in the FORWARD PLAY mode.

Make fine adjustments of the erase head height and tape guide height adjustment screws as necessary, to attain on the recording/reproducing head face the tape position shown in Fig. 5.

5. Run the tape in the forward play mode and check it for zigzag running. (Shown in Fig. 5)

If zigzag tape running occurs, repeat step 4.

6. Place the recorder in the reverse play mode and perform the above steps 4 and 5.

7. Repeat steps 5 and 6 two or three times and verify that the tape position shown in Fig. 5 is ensured.

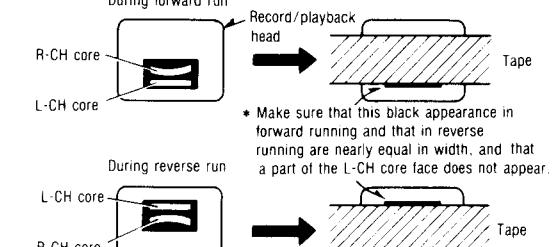


Fig. 5

L-CH/R-CH output balance adjustment

8. Make connections as shown in fig. 6.
9. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM).

Adjust the azimuth screw (Forward) shown in fig. 7 for maximum output L-CH and R-CH levels.

When the output levels of L-CH and R-CH are not at maximum at the same point adjust as follows.

10. Turn the azimuth screw (Forward) shown in fig. 7 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., point where L-CH and R-CH outputs are balanced. (Refer to figs. 7 and 8.)

11. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

L-CH/R-CH phase adjustment

12. Make connections as shown in fig. 9.
13. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM). Adjust the azimuth screw (Forward) shown in fig. 7 so that pointers of the two VTVMs swing to maximum and a lissajous waveform as illustrated in fig. 9-1 is obtained on the oscilloscope.

14. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

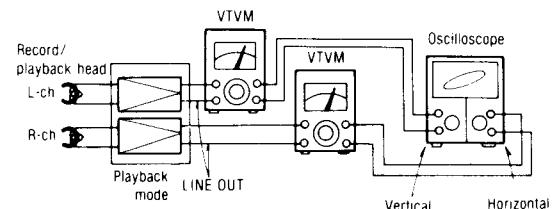


Fig. 9

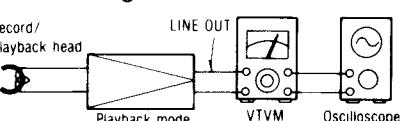


Fig. 6

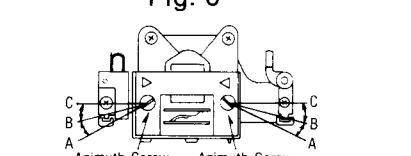


Fig. 7

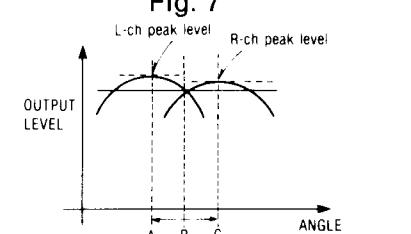


Fig. 8



Fig. 9-1

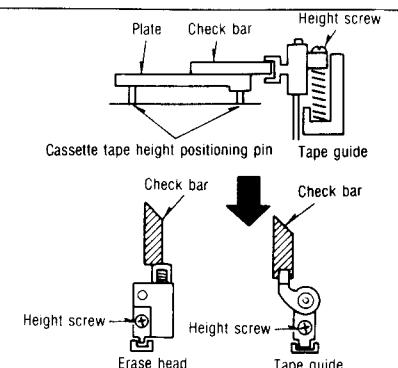
Checking the difference in level between forward and reverse running

15. Reproduce the playback level adjustment signal (315Hz at 0dB) on the standard playback adjustment tape, and check that the difference between the level in forward running and that in reverse running is within 1.0dB.
16. After adjustment, lock the erase head height, tape guide height and angle adjustment screws.

Head Height Adjustment using the Head Adjustment Jig (QZZ0207)

The head adjustment jig (QZZ0207) enables accurate, speedy head height adjustment in the following manner.

- a. Place the plate onto the mechanism.
- b. Set the mechanism to the PLAY mode.
- c. Place the check bar onto the plate.
- d. Pass the check bar through each tape guide.
- e. Adjust the height screw so that the check bar does not touch any of the tape guides.
- f. Run a mirror tape (QZZCRD) and check to see that the tape does not touch (twist around, etc.) the tape guide.
- g. After that, adjust items 4 thru 13 in the adjustment procedure.



B Takeup torque

Condition:
 • Playback mode

Equipment:
 • DC voltmeter
 • Test tape...QZZSRKCT

1. Set the test tape (or RT-60) into the cassette holder.

2. Adjust the takeup torque adjusting potentiometer VR601 in the forward playback mode for 3.5 volts between the FF/REW motor terminals.

3. Run the QZZSRKCT takeup torque measurement tape in the forward playback mode and check that the torque is within quoted tolerance.

Standard value: $50 \pm 10 \text{ gr-cm}$

C Tape speed

Condition:
 • Playback mode

Equipment:
 • Digital frequency counter
 • Test tape...QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 10.

2. Playback test tape (QZZCWAT 3,000 Hz), and supply playback signal to the digital frequency counter.

3. Measure this frequency.

4. On the basis of 3,000 Hz, determine value by following formula:

$$\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100\% \quad \text{where, } f = \text{measured value}$$

5. Take measurement at middle section of tape.

Standard value: $\pm 1.5\%$

6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1.

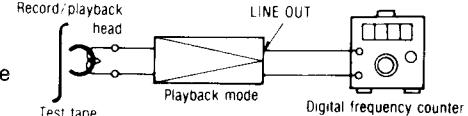


Fig. 10

Tape speed fluctuation

Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:

$$\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100\% \quad f_1 = \text{maximum value}, f_2 = \text{minimum value}$$

Standard value: Less than 1%

NOTE:

Please use non metal type screwdriver when you adjust tape speed on this unit.

D Playback frequency response

Condition:

- Playback mode
(Forward • Reverse)
- Normal tape mode

Equipment:

- VTVM
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 6.
2. Playback the frequency response portion of test tape (QZZCFM).
3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 11).

Playback frequency response (Forward • Reverse)

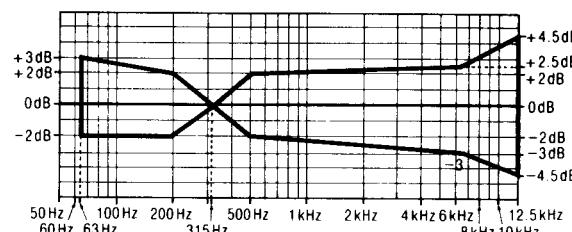


Fig. 11

E Playback gain

Condition:

- Playback mode
- Normal tape mode

Equipment:

- VTVM
- Oscilloscope
- Test tape...QZZCFM

1. Test equipment connection is shown in fig. 6.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz) and, using VTVM, measure the output level at test points [TP7 (L-CH), TP8 (R-CH)].
3. Make measurements for both channels.

Standard value: 0.42 ± 0.05 V [around 0.28V: at test points TP7 (L-CH) and TP8 (R-CH)]

Adjustment

1. If the measured value is not within standard the adjust VR1 (L-CH) or VR2 (R-CH) (See fig. 1).
2. After adjustment, check "Playback frequency response" again.

F Erase current

Condition:

- Record mode
- Metal tape mode

Equipment:

- VTVM
- Oscilloscope

1. Test equipment connection is shown in fig. 12.

2. Place UNIT into metal tape mode.

3. Press the record and pause buttons.

4. Read voltage on VTVM and calculate erase current by following formula:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R301}}{1 (\Omega)}$$

Standard value: 155 ± 15 mA (Metal)

Adjustment

- If the measured value is not within standard value, adjust VR10 (shown in fig. 1).

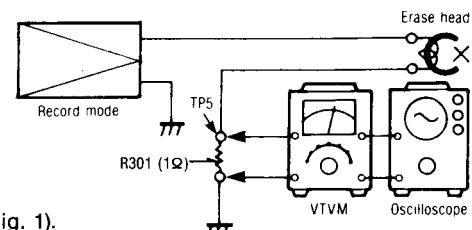


Fig. 12

G Overall frequency response

Condition:

- Record/playback mode
- Normal tape mode
- CrO₂ tape mode
- Metal tape mode
- Input level control...MAX

Equipment:

- VTVM
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)

- Test tape (reference blank tape)
 - ...QZZCRA for Normal
 - ...QZZCRX for CrO₂
 - ...QZZCRZ for Metal

Note:

Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)

1. Make connections as shown in fig. 13.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is -20dB below standard recording level (standard recording level = 0 VU).
5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 12.5kHz signals, and record these signals on the test tape.
6. Playback the signals recorded in step 5, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 14). (If the curve is within the charted specifications, proceed to steps 7, 8 and 9.)
- If the curve is not within the charted specifications, adjust as follows;

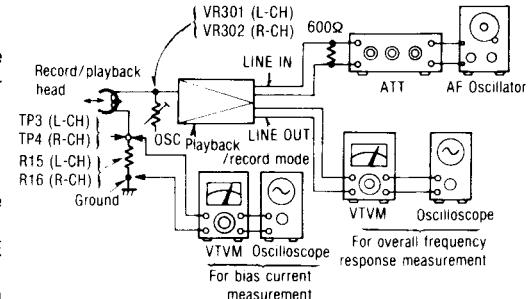


Fig. 13

Overall frequency response chart (Normal)

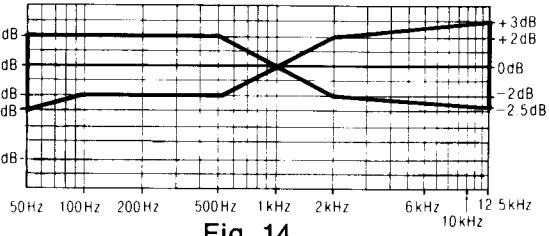


Fig. 14

Adjustment (A):

When the curve exceeds the overall specified frequency response chart (fig. 14) as shown in fig. 15.

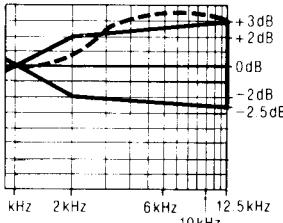


Fig. 15

- 1) Increase bias current by turning VR301 (L-CH) and VR302 (R-CH). (See fig. 1 on page 6.)
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 14.)
- 3) If the curve still exceeds the specifications (fig. 14), increase bias current further and repeat steps 5 and 6.

7. Place UNIT into CrO₂ tape mode.
8. Change test tape to CrO₂ reference blank test tape (QZZCRX), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 15kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO₂ tapes (fig. 17).
9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz and 15kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 17).
10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.

- Read voltage on VTVM between ground and test point (TP3 for L-CH, TP4 for R-CH) and calculate bias current by following formula:

$$\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$$

around 200μA (Normal position)
Standard value: around 300μA (CrO₂ position)
around 400μA (Metal position)

Adjustment (B):

When the curve falls below the overall specified frequency response chart (fig. 14) as shown in fig. 16.

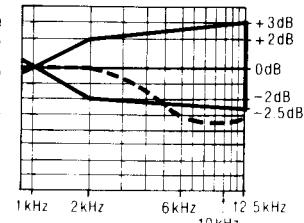


Fig. 16

- 1) Reduce bias current by turning VR301 (L-CH) and VR302 (R-CH).
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 14.)

- 3) If the curve still falls below the charted specifications (fig. 14), reduce bias current further and repeat steps 5 and 6.

Overall frequency response chart (CrO₂, Metal)

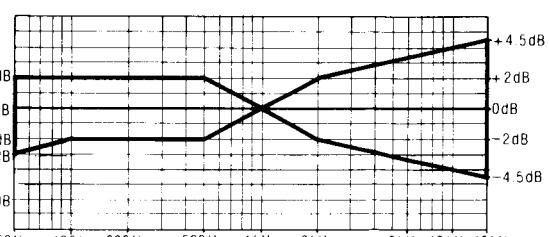


Fig. 17

① Overall gain

Condition:

- Record/playback mode
- Normal tape mode
- Input level controls...MAX
- Standard input level;
 - MIC -72 ± 4 dB
 - LINE IN -24 ± 4 dB

Equipment:

- VTVM
 - ATT
 - Resistor (600Ω)
 - Test tape
 - AF oscillator
 - Oscilloscope
- (reference blank tape)
...QZZCRA for Normal

1. Test equipment connection is shown in fig. 18.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT (-24 dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.42V.
6. Playback recorded tape, and make sure that the output level at LINE OUT becomes 0.42V.
7. If measured value is not $0.42V \pm 2$ dB, adjust it by using VR3 (L-CH) or VR4 (R-CH).
8. Repeat from step (2).

Standard value: $0.42V \pm 2$ dB
[around 0.28V: at test points TP7 (L-CH) and TP8 (R-CH)]

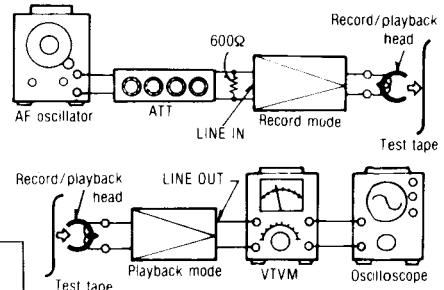


Fig. 18

② Dolby NR circuit

Condition:

- Record mode
- Dolby NR switch...IN/OUT
- Dolby NR select switch...B/C
- Input level control...MAX
- Output level control...MAX
- Balance control...Center

Equipment:

- VTVM
- ATT
- Resistor (600Ω)
- AF oscillator
- Oscilloscope

Record side

- Check of the Dolby-B type encoder characteristics
- 1. Make connections as shown in fig. 19.
- 2. Set the unit to the record mode. (NR select switch is OUT.)
- 3. Apply a 1kHz signal to LINE IN.
- 4. Adjust the ATT so that the output level at TP7 (L-CH) and TP8 (R-CH) is 12.3mV.
- 5. The output level at pin 14 should be 0dB.
- 6. Set the NR select switch to B, and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+6dB \pm 2.5$ dB.
- 7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at pin 14 should be 0dB.
- 8. Set the NR select switch to B and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+8dB \pm 2.5$ dB.
- Check of Dolby-C type encoder characteristics
- 9. Repeat steps 1-5 above.
- 10. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+11.5dB \pm 2.5$ dB.
- 11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at pin 14 should be 0dB.
- 12. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+8.5dB \pm 2.5$ dB.

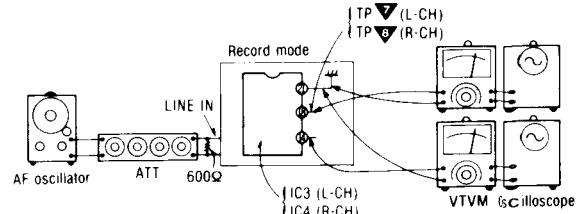


Fig. 19

**③ Attack recovery time adjustment
(dbx circuit)**

Condition:

- Record mode
- Input level control...MAX
- Noise reduction selector ...dbx tape

Equipment:

- VTVM
- ATT
- AF oscillator
- DC voltmeter

1. Make the connections as shown in fig. 20 and apply 1kHz -27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode, adjust ATT so that the signal level at C107 (L-CH) and C108 (R-CH) is 300mV.
3. Read voltage on DC voltmeter.

Reference value: 15 ± 0.5 mV

4. If measured value is not within reference, adjust VR9 (shown in fig. 1).

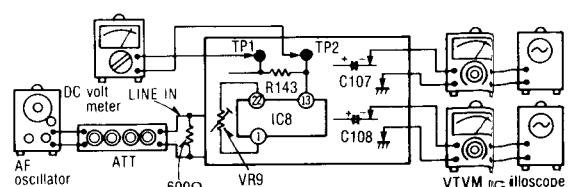


Fig. 20

K Input scanning time adjustmentCondition:
• Stop modeEquipment:
• Oscilloscope

- Place the recorder in the stop mode.
- Connect an oscilloscope to pin 31 of IC601, as shown in Fig. 21.
- If the measured value is not within standard value, correct it by opening or closing the jumper junctions (A) and (B) as follows (See Fig. 22):
 - After closing (A) and opening (B), read the resulting value.
 - If it is less than 70Hz, close (B).
 - If more than 120Hz, open (A) but close (B).
 - If opening (A) and closing (B) do not cause the reading to be less than 120Hz, open both (A) and (B).

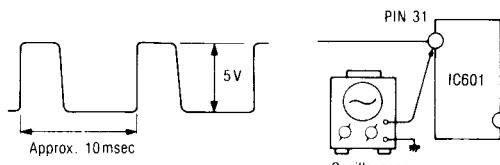
Standard value: $100 + 20$
 $- 30$ Hz (pulse frequency)

Fig. 21

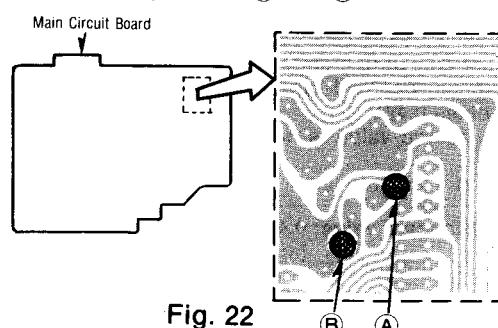


Fig. 22

L Fluorescent meterCondition:
• Record mode
• Input level controls...MAXEquipment:
• VTVM
• ATT
• AF oscillator

• Check for FL meter

To check the accuracy of the FL meter, measure the output level at test point [TP7 (L-CH), TP8 (R-CH)].

- Make connections as shown (See fig. 23).
- Connect a wire between TP501 and TP502 terminal (See fig. 24).
- In the recording pause mode, apply 1kHz (-24dB) to LINE IN.
- Adjust ATT so that output level at test point [TP7 (L-CH), TP8 (R-CH)] is 0.28V.

Checking FL meter 0dB segment display ON/OFF

Change the output level at test point [TP7 (L-CH), TP8 (R-CH)] from 0.28V -1dB (=250mV) to 0.28V +1dB (=310mV) by adjusting the attenuator, and check that the FL meter 0dB segment display OFF state changes to the ON state.

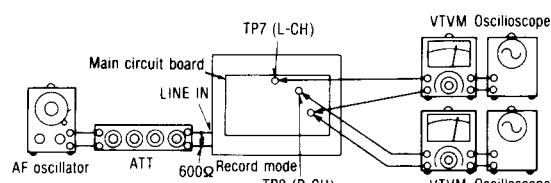


Fig. 23

Checking FL meter -40dB segment display ON/OFF

Lower the signal level 28dB below the standard input level (-24dB-28dB=-52dB=2.5mV) and then further lower the level 12dB (-52dB-12dB=-64dB=0.63mV) by adjusting the attenuator. While lowering the level as described above, make sure that only the -40dB display remains lit the dims or goes off at the lowest level.

• Adjustment for FL meter

- Make connections as shown (See fig. 23).
- Connect a wire between TP501 and TP502 terminal (See fig. 24).
- In the recording pause mode, apply 1kHz (-24dB) to LINE IN.
- Adjust ATT so that output level at test point [TP7 (L-CH), TP8 (R-CH)] is 0.28V.

-40dB adjustment

- Adjust ATT so that the level adjusted at step 4 is reduced by 40dB.
- At this time, check that -40dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 25).
- If the indicator is not lighted halfway as described in step 6, adjust VR8.

0dB adjustment

- Restore the condition of step 4 (set output level to 0.28V at test point [TP7 (L-CH), TP8 (R-CH)].
- At this time, check that 0dB indicator is dimmed (intermediate brightness between full brightness and light-out (See fig. 26).
- If improper, adjust VR501.
- Repeat adjustments at steps 4, 5, 6, 7, 8, 9 and 10 two or three times.
- Disconnect the wire between TP501 and TP502 terminal, which had been connected at step 2.

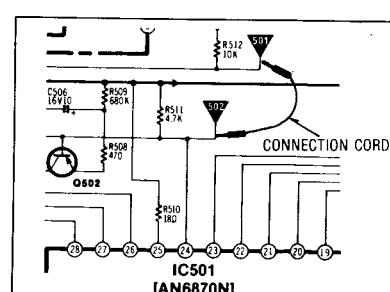


Fig. 24

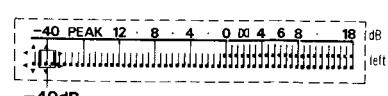


Fig. 25

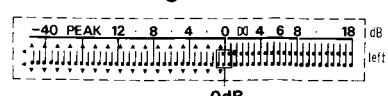
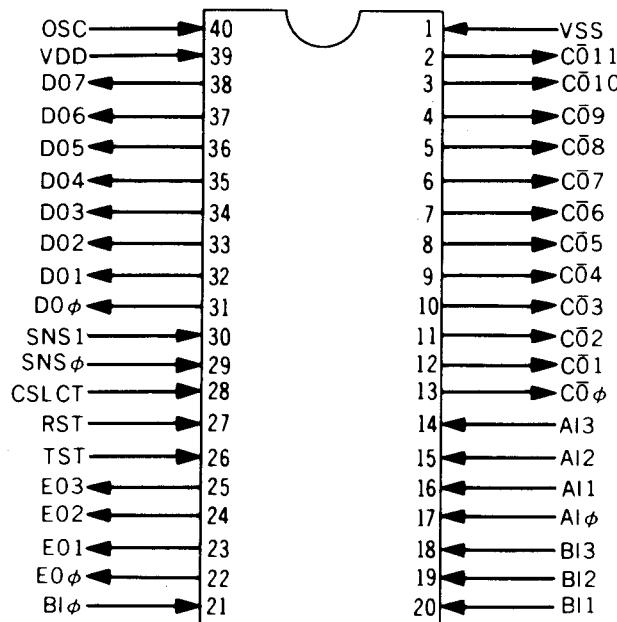
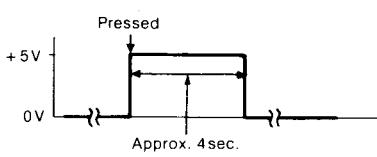
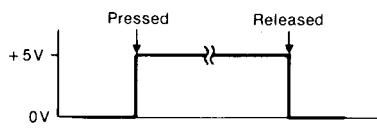
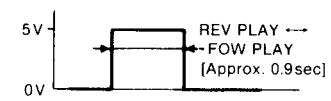


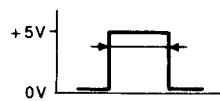
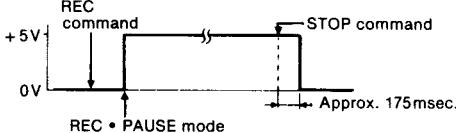
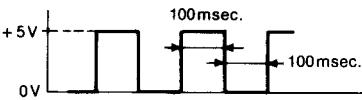
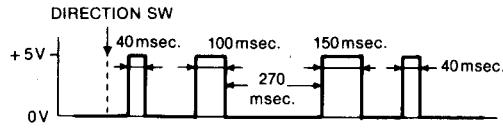
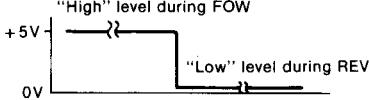
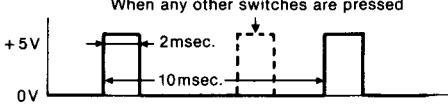
Fig. 26

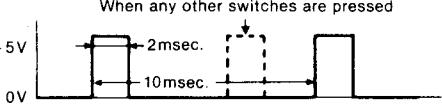
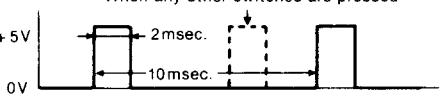
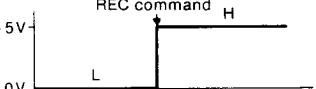
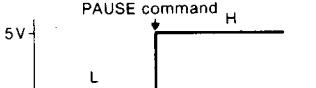
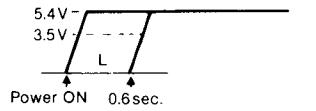
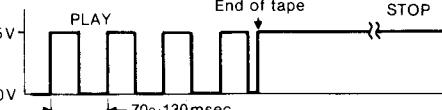
MICROCOMPUTER TERMINAL FUNCTION AND WAVEFORM (IC601: MN1405RMS)

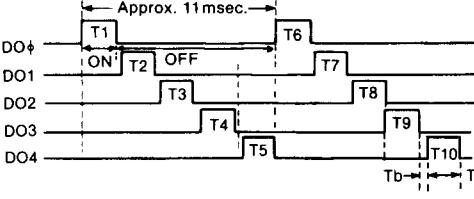
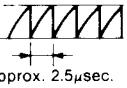
(BOTTOM VIEW)



Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	Music select (M.S) command	• "High" level with music select at ON.
3.	CO10	Blank skip (B.S) command	• "High" level with blank skip at ON.
4.	CO9	Music repeat (M.R) command	• "High" level with music repeat at ON.
5.	CO8	REC MUTE	• "High" level pulse with REC MUTE button pressed during REC PLAY. 
6.	CO7	CUE/REVIEW MUTE	• "High" level pulse with CUE/REVIEW button pressed during PLAY. 
7.	CO6	Drive motor CCW rotation command	• "High" level pulse in each mode in operational sequence REV PLAY → PAUSE → STOP → FOW PLAY. • During switching between REV PLAY and FOW PLAY. 

Terminal No.	Symbol	Name	Function/operation
8.	CO5	Drive motor CW rotation command	<ul style="list-style-type: none"> “High” level pulse in each mode in operational sequence FOW PLAY → PAUSE → STOP → REV PLAY. 
9.	CO4	Muting for all amplifiers	<ul style="list-style-type: none"> “High” level during FF, REW and STOP. “Low” level during REC, PLAY and CUE/REV.
10.	CO3	Bias oscillation ON/OFF	<ul style="list-style-type: none"> Goes to “High” immediately after REC or PAUSE operation. Remains in “High” during REC or PLAY operation. Goes to “Low” approximately 175msec after the STOP command is given. 
11.	CO2	FF/REW motor rotation select (FF/REW motor CCW rotation command)	<ul style="list-style-type: none"> “High” level during: <ul style="list-style-type: none"> FOW PLAY FOW FF REV REW
12.	CO1	FF/REW motor rotation select (FF/REW motor CW rotation command)	<ul style="list-style-type: none"> “High” level during: <ul style="list-style-type: none"> REV PLAY REV FF FOW REW
13.	COφ	FF and REW blinking-indication command	<ul style="list-style-type: none"> “High” level during FF and REW. 
14.	AI3	Reading of input switch state CAM B (S606)	<ul style="list-style-type: none"> Input in switching-over from FOW PLAY to REV PLAY. 
15.	AI2	Reading of input switch state CAM A (S605)	<ul style="list-style-type: none"> “High” level during FOW “Low” level during REV 
16.	AI1	Connection to +B (bias)	
17.	AIφ	Reading of input switch state REC INH	<ul style="list-style-type: none"> “High” level when a tape not prepared with miserase prevention masking is loaded. “Low” level with the cassette lid open.
18.	BI3	Reading of input switch state DIR	<ul style="list-style-type: none"> Waveform when the cassette lid is closed with no tape loading. <p style="text-align: center;">When any other switches are pressed</p> 

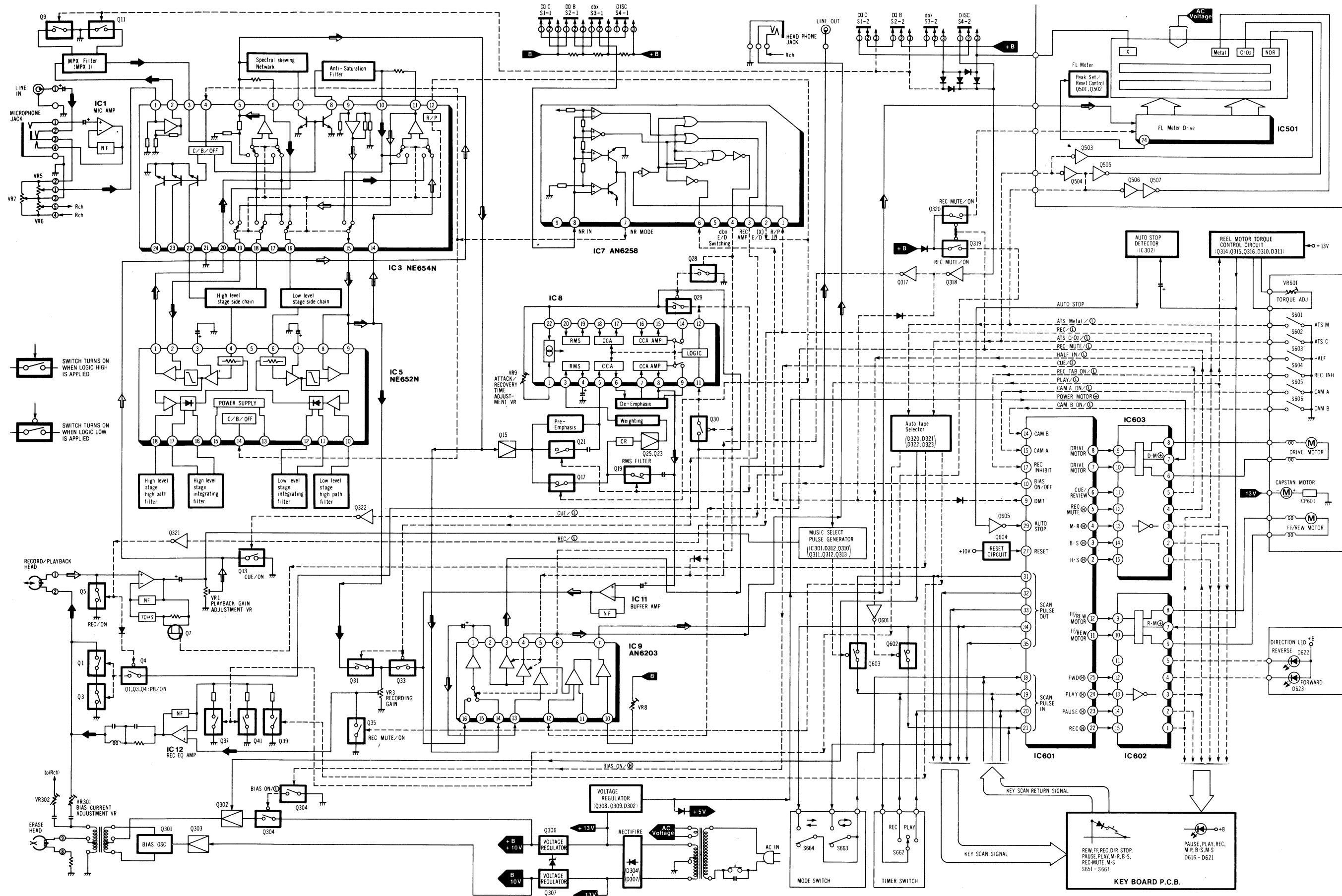
Terminal No.	Symbol	Name	Function/operation
19.	BI2	Reading of input switch state REC • PLAY	<ul style="list-style-type: none"> Waveform when the cassette lid is closed with no tape loading. 
20.	BI1	Reading of input switch state BS • PAUSE • FF	<ul style="list-style-type: none"> Waveform when the cassette lid is closed with no tape loading. 
21.	BIφ	Reading of input switch state BS • PAUSE • FF	<ul style="list-style-type: none"> Waveform when the cassette lid is closed with no tape loading. 
22.	EOφ	REC indication output	<ul style="list-style-type: none"> "High" level concurrently with REC command. In TIMER REC mode, "High" level just after power on. In TIMER REC mode, "High" level remains unchanged even if the automatic stop reset mechanism operates with power on. 
23.	EO1	PAUSE indication output	<ul style="list-style-type: none"> "High" level concurrently with PAUSE command. 
24.	EO2	Reel takeup torque selection and blank skip LED indication	<ul style="list-style-type: none"> "High" level during PLAY. "Low" level during FF, REW and STOP.
25.	EO3	DIRECTION indication output	<ul style="list-style-type: none"> "Low" level during FORWARD. "High" level during REVERSE.
26.	—	—	<ul style="list-style-type: none"> Connection to GND.
27.	RST	Reset terminal	<ul style="list-style-type: none"> Terminal for reset signal to computer. Reset at "Low" level (less than 0.8 volts). 
28.	CSLCT	—	<ul style="list-style-type: none"> Non connection.
29.	SNSφ	End-of-tape detection	

Terminal No.	Symbol	Name	Function/operation
30.			<ul style="list-style-type: none"> Non connection.
31.	DOφ	Input switch scanning	 <p>Pulse width: Ta = Approx. 2.0msec, Tb = Approx. 100μsec.</p>
32.	DO1		
33.	DO2		
34.	DO3		
35.	DO4		
36.	DO5		
37.	DO6		<ul style="list-style-type: none"> Non connection.
38.	DO7		
39.	VDD	Power supply terminal	<ul style="list-style-type: none"> Operative on 4.6 to 6.0 volts (typically 5.5 volts).
40.	OSC	Oscillation terminal	<ul style="list-style-type: none"> Generates oscillation at approximately 600kHz. Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements. Use DOφ to 4 in measuring the computer's velocity; Approx. 125Hz in STOP condition. 

NOTES:

- S1-1, S1-2 Dolby-C IN/OUT switch (shown in OUT position).
 - S2-1, S2-2 Dolby-B IN/OUT switch (shown in OUT position).
 - S3-1, S3-2 dbx "Tape" IN/OUT switch (shown in OUT position).
 - S4-1, S4-2 dbx "Disc" IN/OUT switch (shown in OUT position).
 - S301 Power ON/OFF switch (shown in OFF position).
 - S302 AC power voltage select switch.
 - S601 Auto tape select switch (for Metal tape).
 - S602 Auto tape select switch (for CrO₂ tape).
 - S603 Half switch (shown in OFF position).
 - S604 REC inhibit switch (shown in OFF position).
 - S605 Forward/Reverse detection switch (shown in OFF position).
 - S606 Mode detection switch (shown in OFF position).
 - S651 Rewind switch (shown in OFF position).
 - S652 F.F switch (shown in OFF position).
 - S653 Record switch (shown in OFF position).
 - S654 Direction switch (shown in OFF position).
 - S655 Stop switch (shown in OFF position).
 - S656 Pause switch (shown in OFF position).
 - S657 Play switch (shown in OFF position).
 - S658 Music repeat switch (shown in OFF position).
 - S659 Blank Skip switch (shown in OFF position).
 - S660 Rec Mute switch (shown in OFF position).
 - S661 Music select switch (shown in OFF position).
 - S662 Timer switch (shown in 1 position). (1...TIMER REC, 2...OFF, 3...TIMER PLAY)
 - S663, S664 Mode selection switch () / () .
- VR1, 2 Playback gain adjustment VR.
 • VR3, 4 Overall gain adjustment VR.
 • VR5, 6 Input level controls.
 • VR7 Balance control.
 • VR8 FL meter adjustment VR (-40dB indication).
 • VR9 Attack/recovery time adjustment VR.
 • VR10 Erase current adjustment VR.
 • VR301, 302 Bias current adjustment VR.
 • VR501 FL meter adjustment VR (0dB indication).
 • VR601 Takeup torque adjustment VR.
 • () This symbol indicates the PNP switching transistor.
 • () This symbol indicates the NPN switching transistor.
 • (→) this arrow indicates the flow of the recording signal. (NR OUT).
 • (→) this arrow indicates the flow of the playback signal. (NR OUT).
 • (→) this arrow indicates the flow of the recording signal and playback signal combination.
 • (→ →) this arrow indicates the flow of the control signal.

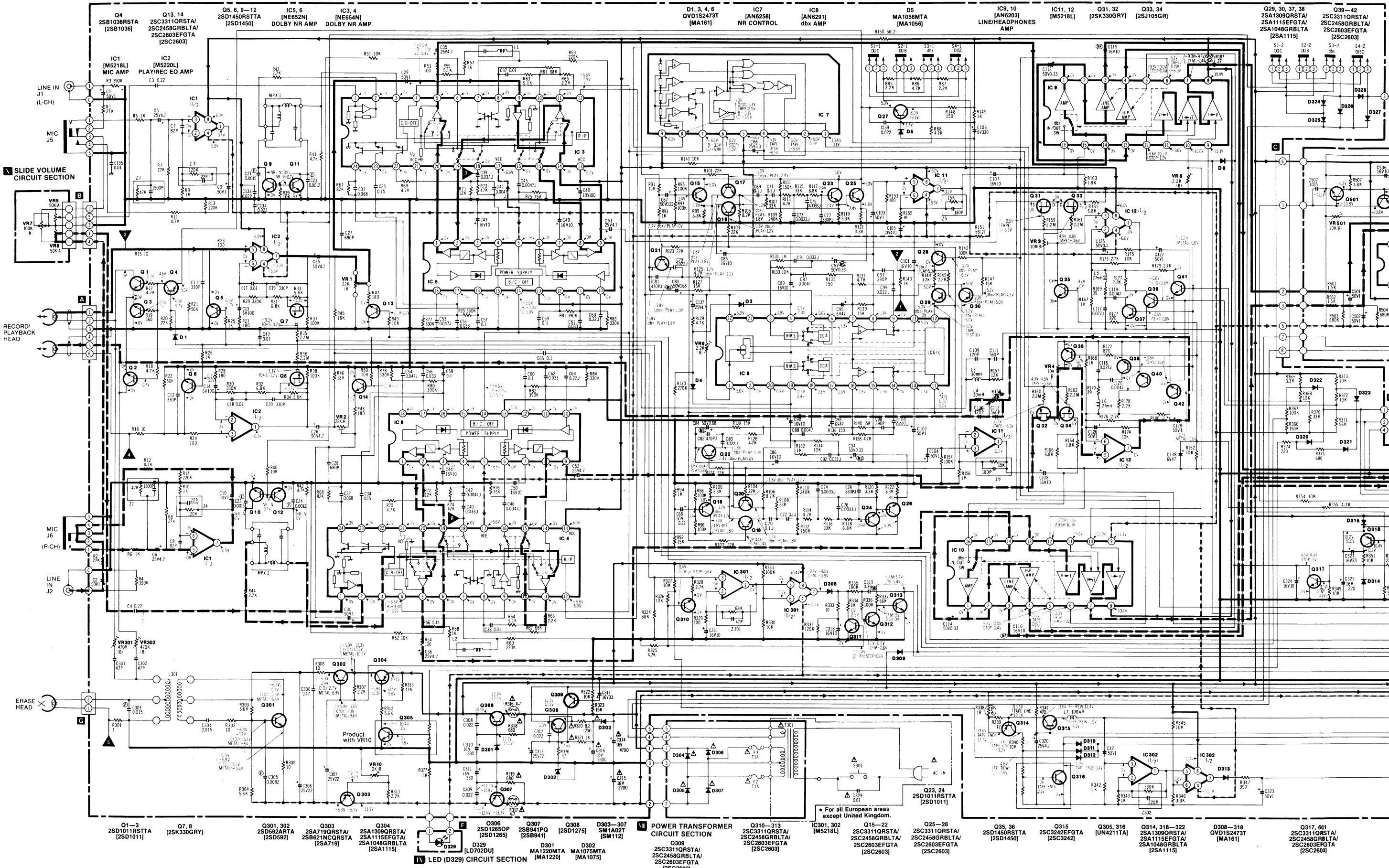
BLOCK DIAGRAM

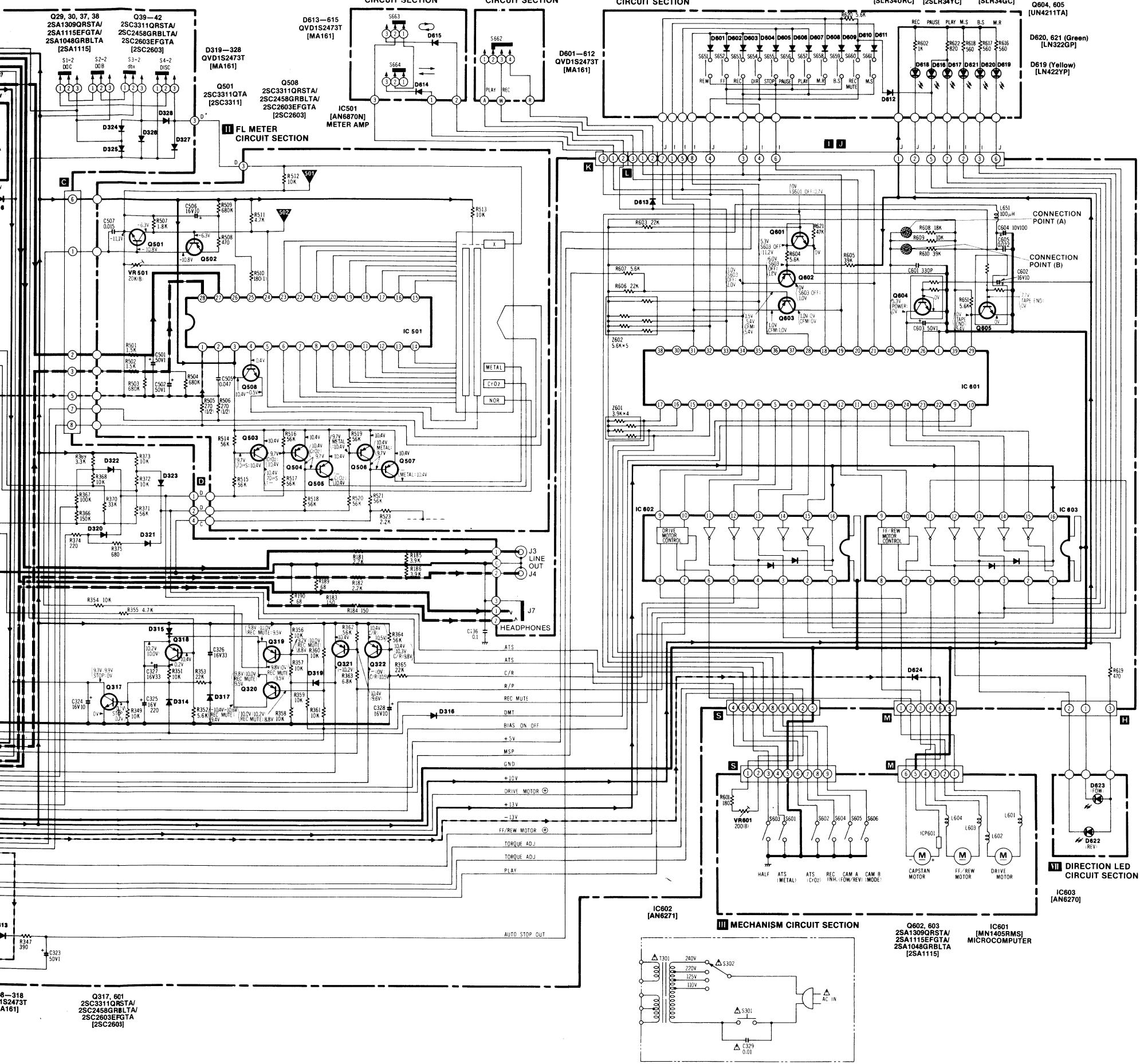


1 2 3 4 5 6 7 8 9

SCHEMATIC DIAGRAM

I MAIN CIRCUIT SECTION





* For United Kingdom.

IC501

1	-11.1V
2	-8.4V (-8.6V)
3	10.4V
4	—
5	—
6	-10.1V Segment 9.3V
23	—
24	-6.3V (-6.4V) CFM 6.4V
25	6.8V (6.7V) CFM 6.4V
26	-8.3V (-8.4V)
27	-9.4V (-9.5V) CFM -7.5V
28	-9.4V (-9.5V) CFM -7.5V

NOTES:

- S1-1, S1-2.....Dolby-C IN/OUT switch (shown in OUT position).
- S2-1, S2-2.....Dolby-B IN/OUT switch (shown in OUT position).
- S3-1, S3-2.....dbx "Tape" IN/OUT switch (shown in OUT position).
- S4-1, S4-2.....dbx "Disk" IN/OUT switch (shown in OUT position).
- S301.....Power ON/OFF switch (shown in OFF position).
- S302.....AC power voltage select switch (for United Kingdom only).
- S601.....Auto tape select switch (for Metal tape).
- S602.....Auto tape select switch (for CrO₂ tape).
- S603.....Half switch (shown in OFF position).
- S604.....REC inhibit switch (shown in OFF position).
- S605.....Forward/Reverse detection switch (shown in OFF position).
- S606.....Mode detection switch (shown in OFF position).
- S651.....Rewind switch (shown in OFF position).
- S652.....F.F switch (shown in OFF position).
- S653.....Record switch (shown in OFF position).
- S654.....Direction switch (shown in OFF position).
- S655.....Stop switch (shown in OFF position).
- S656.....Pause switch (shown in OFF position).
- S657.....Play switch (shown in OFF position).
- S658.....Music repeat switch (shown in OFF position).
- S659.....Blank Skip switch (shown in OFF position).
- S660.....Rec Mute switch (shown in OFF position).
- S661.....Music select switch (shown in OFF position).
- S662.....Timer switch (shown in 1 position).
 - (1...TIMER REC, 2...OFF, 3...TIMER PLAY)
- S663, S664.....Mode selection switch (/ →).
- VR1, 2.....Playback gain adjustment VR.
- VR3, 4.....Overall gain adjustment VR.
- VR5, 6.....Input level controls.
- VR7.....Balance control.
- VR8.....FL meter adjustment VR (-40dB indication).
- VR9.....Attack recovery time adjustment VR.
- VR10.....Erase current adjustment VR.
- VR301, 302.....Bias current adjustment VR.
- VR501.....FL meter adjustment VR (0dB indication).
- VR601.....Takeup torque adjustment points.
- Point (A), (B).....Input scanning time adjustment VR.
- L1, L2.....Skewing Network.
- L3, L4.....Bias Trap Coil.
- L5, L6.....Peaking Coil.
- L7.....Choke Coil.
- L301.....Bias Trap Coil.
- L601-L604.....Choke Coil.
- L651.....Choke Coil.
- MPX1, 2.....Multiplex Filter.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
- 1K = 1,000Ω, 1M = 1,000kΩ.
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.

IC601

1	0V
2	0V MS 5.3V
3	0V BS 5.3V
4	0V MR 5.3V
5	0V REC MUT 5.3V
6	0V C/R 5.3V
7	0V
8	0V
9	0V STOP 5.3V
10	0V (3.8V)
11	5.3V REV/PLAY 0V
12	0V REV/PLAY 5.3V
13	0V
14	0V
15	5.4V REV 0V
16	5.4V
17	0V
18	1.0V (0V)
19	1.0V (0V)
20	1.0V
21	0V
22	0V (5.3V)
23	0V PAUSE 5.4V
24	5.3V STOP 0V
25	0V REV 5.4V
26	0V
27	0V Power ON 0V
28	5.4V
29	5.4V TAPE END 5.4V
30	0V
31	1.0V
35	0V
36	0V
37	0V
38	0V
39	5.4V
40	2.2V

IC602

1	10.1V (0.1V)
2	— (2.1V) PAUSE 0V
3	0.2V STOP 10.4V
4	1.8V REV 0V
5	0V REC 0.9V
6	4.1V REV/PLAY 0V
7	4.1V
8	0V REV/PLAY 5.0V
9	0V REV/PLAY 5.3V
10	0V
11	0V C/R 5.3V
12	0V REC MUTE 5.3V
13	0V MR 5.3V
14	0V BS 5.3V
15	0V MS 5.3V
16	13.8V (13.6V)

IC603

1	9.0V (8.9V) MS 0V
2	9.0V (8.9V) BS 0V
3	9.0V (8.9V) MR 0V
4	9.6V (10.1V) REC MUTE 0V
5	10.1V (10.2V) C/R 0V
6	0V
7	6.3V
8	0V
9	0V
10	0V
11	0V C/R 5.3V
12	0V REC MUTE 5.3V
13	0V MR 5.3V
14	0V BS 5.3V
15	0V MS 5.3V
16	13.8V (13.6V)

ELECTRICAL PARTS LIST

- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
 - () Voltage values at record mode.
 - Tape Voltage values at dbx tape mode.
 - disc Voltage values at dbx disc mode.
 - CrO₂ Voltage values at CrO₂ tape mode.
 - Metal Voltage values at Metal tape mode.
 - Stop Voltage values at Stop mode.
 - C/R Voltage values at CUE/REV mode.
 - FF/REW Voltage values at FF/REW mode.
 - REC MUTE Voltage values at REC MUTE mode.
 - 70μs Voltage values at CrO₂ or Metal tape mode.
 - NR IN Voltage value at which the noise reduction switch is turned on.
 - B Voltage values at Dolby-B mode.
 - C Voltage values at Dolby-C mode.
 - MS Voltage values at music select mode.
 - BS Voltage values at blank skip mode.
 - MR Voltage values at music repeat mode.
 - CFM Voltage value at which the test tape QZZCFM (315Hz/0dB) is played.
 - Segment Voltage value at which the corresponding FL meter segment is lit.
 - POWER ON Voltage value at which the power source is on.
 - TAPE END Voltage at the end of the cassette tape.
 - S603: OFF Voltage at which the S603 switch is off.
 - For measurement use VTVM.
 - (—) indicates B+ (bias).
 - (—) indicates B- (bias).
 - (—) indicates the flow of the playback signal. (NR out).
 - (—) indicates the flow of the recording signal. (NR out).
 - Important safety notice
- Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Described in the schematic diagram are two types of numbers; the supply parts numbers and production parts number for transistors and diodes. One type of number is used for supply parts number and production parts number when they are identical.
 - e.g. Q1
2SC1844(E,F) — Production parts number
[2SC1844E] — Supply parts number
D212
1S2473T77 — Production parts number
[MA161] — Supply parts numbers
 - The supply parts number is described alone in the replacement parts list.

This schematic diagram may be modified at any time with the development of new technology.

SPECIFICATIONS	
Playback S/N ratio * Test tape...QZZCFM	Greater than 45dB
Overall distortion * Test tape ...QZZCRA for Normal ...QZZCRX for CrO ₂ ...QZZCRZ for Metal	Less than 4%
Overall S/N ratio * Test tape...QZZCRA	Greater than 43dB (without NAB filter)

NOTES: RESISTORS

RESISTORS	
ERD	Carbon
ERG	Metal-oxide
ERS	Metal-oxide
ERO	Metal-film
ERX	Metal-film
ERQ	Fuse type metallic
ERC	Solid
ERF	Cement
ECBA	Ceramic
ECG	Ceramic
ECK	Ceramic
ECC	Ceramic
ECF	Ceramic
ECQM	Polyester film
ECQE	Polyester film
ECQF	Polypropylene
ECEO	Electrolytic
ECEON	Non polar electrolytic
ECQS	Polystyrene
ECSD	Tantalum
QCS	Tantalum

CAPACITORS

ECBA	Ceramic
ECG	Ceramic
ECK	Ceramic
ECC	Ceramic
ECF	Ceramic
ECQM	Polyester film
ECQE	Polyester film
ECQF	Polypropylene
ECEO	Electrolytic
ECEON	Non polar electrolytic
ECQS	Polystyrene
ECSD	Tantalum
QCS	Tantalum

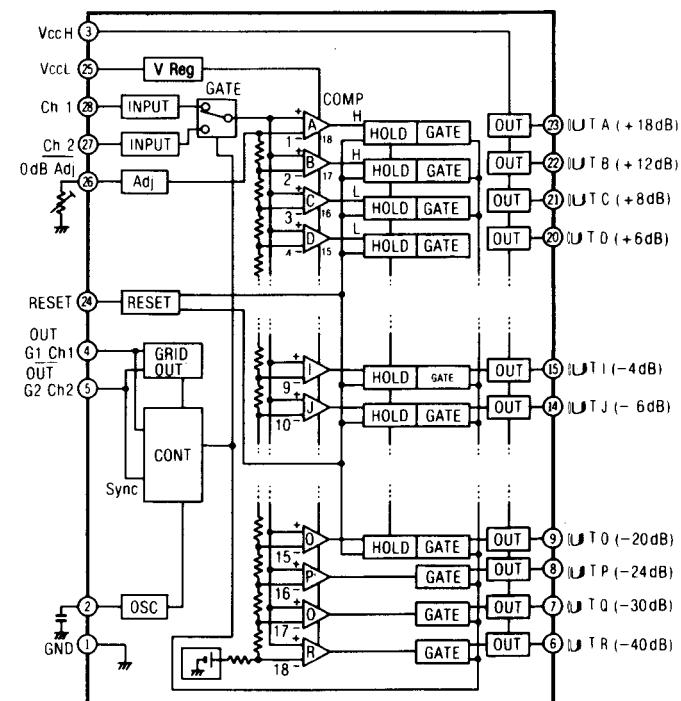
REPLACEMENT PARTS LIST

Important safety notice
Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS			
R 37, 38	ERD25TJ104	R 39, 40	ERD25FJ103
R 3, 4	ERD25TJ394	R 41, 42	ERD25FJ472
R 5, 6	ERD25FJ102	R 43, 44	ERD25FJ272
R 7, 8	ERD25TJ273	R 45, 46	ERD25TJ183
R 9, 10	ERD25FJ102	R 47, 48	ERD25FJ181
R 11, 12	ERD25FJ472	R 49, 50, 51, 52	ERD25FJ103
R 13, 14	ERD25TJ224	R 53, 54	ERD25FJ101
R 15, 16	ERD25FJ100	R 55, 56	ERD25FJ512
R 17, 18	ERD25FJ472	R 57, 58	ERD25FJ102
R 19	ERD25FJ561	R 59, 60	ERD25TJ224
R 20	ERD25TJ223	R 61, 62	ERD25TJ683
R 21, 22	ERD25FJ563	R 63, 64	ERD25FJ512
R 23, 24	ERD25FJ101	R 65, 66	ERD25FJ222
R 25, 26	ERD25FJ102	R 67, 68	ERD25TJ823
R 27, 28	ERD25FJ181	R 69, 70	ERD25FJ472
R 29, 30	ERD25TJ334	R 71, 72	ERD25TJ123
R 31, 32	ERD25FJ682	R 73, 74	ERD25TJ473
R 33, 34	ERD25FJ562	R 75, 76	ERD25TJ753
R 35, 36	ERD25TJ225		

EQUIVALENT CIRCUIT

IC501: AN6870N

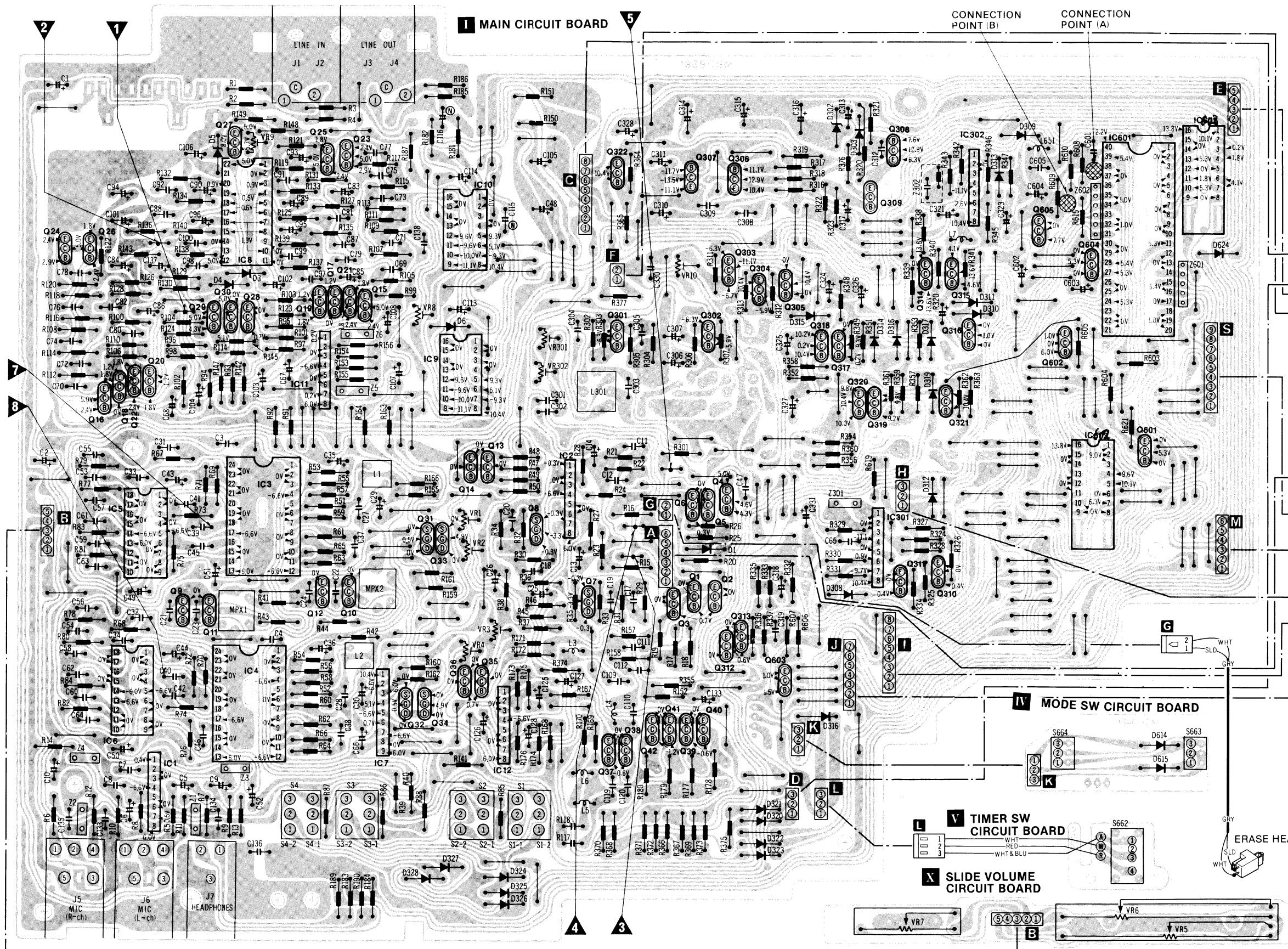
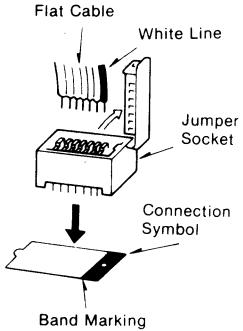


Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.		Part No.	Ref. No.	Part No.	Part Name & Description
R 77, 78	ERD25TJ334	R 337	ERD25TJ563	C 43, 44	ECEA1CS100					MULTIPLEX FILTERS
R 79, 80, 81, 82	ERD25TJ394	R 338	△ ERO14AJ180	C 45, 46	ECQMIH472JZ					MUX 1, 2 QLM9Z10K Multiplex Filter
R 83, 84	ERD25TJ334	R 339	ERD25FJ120	C 47	ECFDD103KVY	Q 1, 2, 3	2SD1011			COILS
R 85	ERD25FJ222	R 340	ERD25FJ103	C 48	ECEA1AS101	Q 4	2SB1036	L 1, 2	ELM7Q306A	Skewing Network
R 86	ERD25FJ472	R 342, 343	ERD25FJ102	C 49, 50	ECEA1CS100	Q 5, 6	2SD1450	L 3, 4	QLQX0343KWA	Bias Trap Coil
R 87	ERD25FJ222	R 345	ERD25FJ103	C 51, 52	ECEA1ES4R7	Q 7, 8	2SK330GRY	L 5, 6	QLQX2722D	Peaking Coil
R 88	ERD25FJ472	R 346	ERD25FJ332	C 53, 54	ECQMIH473JZ	Q 9, 10, 11, 12		L 7	QLQX1012DT	Choke Coil
R 91, 92	ERD25TJ153	R 347	ERD25FJ391	C 55, 56	ECQMIH333JZ			L 301	QLB0198	Bias Trap Coil
R 93, 94	ERD25FJ102	R 349	ERD25FJ103	C 57, 58, 59, 60				L 601, 602, 603, 604	ELEH101KA	Choke Coil
R 95, 96, 97, 98	ERD25TJ103	R 351	ERD25FJ103	C 61, 62	ECQMIH333JZ			L 651	QLQX1012DT	Choke Coil
R 99, 100	ERD25FJ332	R 352	ERD25FJ562	C 63, 64	ECQMIH224JZ	Q 13, 14, 15, 16, 17, 18, 19, 20,				
R 101, 102, 103, 104	ERD25TJ223	R 353	ERD25TJ223	C 65	ECQMIH104JZ	21, 22	2SC2603			
R 354	ERD25FJ103	R 355	ERD25FJ472	C 66	ECEA50Z3R3	Q 23, 24	2SD1011			
R 356, 357, 358, 359, 360, 361	ERD25TJ223	R 358	ERD25FJ360	C 67, 68	ECEA1HSR22	Q 25, 26, 27, 28				
R 105, 106	ERD25FJ822	R 359	ERD25FJ103	C 69, 70, 71, 72						
R 107, 108	ERD25TJ333	R 360	ERD25TJ563	C 73, 74, 75, 76						
R 109, 110	ERD25TJ244	R 363	ERD25FJ682	C 76, 77	ECQMIH332JZ	Q 37, 38	2SA1115			
R 111, 112	ERD25TJ154	R 364	ERD25TJ563	C 78, 79	ECCD1H331J	Q 39, 40, 41, 42	2SC2603			
R 113, 114	ERD25FJ472	R 365	ERD25TJ223	C 80, 81	ECQMIH223JZ	Q 301, 302	2SD592			
R 115, 116	ERD25TJ333	R 366	ERD25TJ154	C 82, 83	ECCD1H471J	Q 303	2SA719			
R 117, 118	ERD25FJ682	R 367	ERD25TJ104	C 84, 85	ECEA50MR68R	Q 304	2SA1115			
R 119, 120, 121, 122	ERD25FJ332	R 368	ERD25FJ103	C 86, 87	ECQMIH104JZ	Q 305	UN4211TA			
R 122, 128	ERD25TJ153	R 369	ERD25FJ332	C 88, 89	ECQMIH472JZ	Q 306	2SD1265			
R 129	ERD25FJ472	R 370	ERD25TJ333	C 90, 91	ECEA16Z10	Q 307	2SB941			
R 130	ERD25TJ274	R 371	ERD25TJ563	C 92, 93	ECQMIH333JZ	Q 308	2SD1275			
R 131, 132	ERD25FJ102	R 372, 373	ERD25FJ103	C 94, 95	ECEA50MR33R	Q 309, 310, 311, 312, 313				
R 133, 134	ERD25FJ103	R 374	ERD25FJ221	C 96, 97	ECEA0JS470	Q 311, 312, 313				
R 135, 136	ERD25FJ151	R 375	ERD25FJ681	C 98, 99	ECCD1H391J	Q 314	2SA1115			
R 137, 138	ERD25FJ472	R 376	ERD25FJ470	C 100, 101	ECQMIH223JZ	Q 315	2SC3242			
R 139, 140	ERD25TJ153	R 377	ERD25FJ102	C 102, 103	ECEA1CS100	Q 316	UN4211TA			
R 141	ERD25FJ103	R 378	ERD25FJ684	C 104	ECEA1HS010	Q 317	2SC2603			
R 142	ERD25TJ104	R 379	ERD25FJ182	C 105, 106	ECQMIH104JZ	Q 318, 319, 320, 321, 322				
R 143	ERD25FJ102	R 380	ERD25FJ471	C 107, 108	ECEA1HS100	Q 323, 324				
R 144	ERD25TJ473	R 381	ERD25FJ684	C 109, 110	ECKD2H121KB	Q 325, 326, 327, 328				
R 145	ERD25FJ222	R 382	ERD25FJ472	C 111, 112	ECKD1H561KB	Q 329	2SA1115			
R 147	ERD25TJ153	R 383	ERD25FJ103	C 113, 114	ECEA50Z3R3	Q 330	2SC2603			
R 148	ERD25FJ151	R 384	ERD25TJ563	C 115, 116	ECEA1CN100	Q 331, 332, 333				
R 149	ERD25FJ102	R 385	ERD25FJ222	C 117, 118	ECQMIH1273JZ	Q 334, 335	2SA1115			
R 150, 151	ERG2ANJ560	R 386	ERD25FJ181	C 119, 120	ECFDD472KVY	Q 336, 337	UN4211TA			
R 152	ERD25FJ103	R 387	ERD25FJ102	C 125, 126	ECEA1HS010	Q 338, 339				
R 153, 154	ERD25TJ104	R 388	ERD25TJ223	C 127, 128		Q 340, 341				
R 155, 156	ERD25FJ102	R 389	ERD25FJ562	C 130, 131	ECFDD223KVY	Q 342, 343				
R 157, 158	ERD25TJ123	R 390	ERD25TJ393	C 132, 133	ECEA1CS311	Q 344, 345				
R 159, 160, 161, 162	ERD25FJ225	R 391	ERD25TJ223	C 134, 135	ECEA1CS312	Q 346, 347				
R 163, 164	ERD25FJ182	R 392	ERD25FJ682	C 136, 137	ECEA1ES4R7	Q 348, 349				
R 165, 166	ERD25FJ822	R 393	ERD25FJ103	C 138, 139	ECKD1H223ZF	Q 350, 351				
R 167, 168	ERD25FJ102	R 394	ERD25TJ393	C 140, 141	ECDD1H470KC	Q 352, 353				
R 169, 170	ERD25FJ390	R 395	ERD25FJ562	C 142, 143	ECQP1153JZ	Q 354, 355				
R 171, 172	ERD25FJ821	R 396	ERD25FJ684	C 144, 145	ECFDD153KVY	Q 356, 357				
R 173, 174	ERD25FJ472	R 397	ERD25FJ561	C 146, 147	ECFDD822KVY	Q 358, 359				
R 175, 176	ERD25FJ103	R 398	ERD25FJ471	C 148, 149	ECEA1ES220	Q 360, 361				
R 177, 178	ERD25FJ222	R 399	ERD25FJ662	C 150, 151	ECQMIH223ZF	Q 362, 363				
R 179, 180	ERD25FJ272	R 400	ERD25TJ473	C 152, 153	ECEA1CS311	Q 364, 365				
R 181, 182	ERD25FJ222	R 401	ERD25FJ821	C 154, 155	ECEA1CS312	Q 366, 367				
R 183, 184	ERD25FJ151	R 402	ERD25FJ684	C 156, 157	ECEA1ES4R7	Q 368, 369				
R 185, 186	ERD25FJ392	R 403	ERD25TJ393	C 158, 159	ECKD1H223ZF	Q 370, 371				
R 187	ERD25FJ270	R 404	ERD25FJ680	C 160, 161	ECQMIH104JZ	Q 372, 373				
R 189, 190	ERD25FJ680	R 405	ERD25FJ1R0	C 162, 163	ECEA1ES4R7	Q 374, 375				
R 301	ERD25FJ1R0	R 406	ERD25TJ393	C 164, 165	ECKD1H223ZF	Q 376, 377				
R 302	ERD25FJ100	R 407	ERD25FJ562	C 166, 167	ECQMIH1394JZ	Q 378, 379				
R 303, 304	ERD25FJ662	R 408	ERD25FJ100	C 168, 169	ECEA1ES4R7	Q 380, 381				
R 305, 306	ERD25FJ100	R 409	ERD25FJ100	C 170, 171	ECEA1HS010	Q 382, 383				
R 307	ERD25FJ222	R 410	ERD25FJ222	C 172, 173	ECEA1HS010	Q 384, 385				
R 311	ERD25FJ222	R 411	ERD25FJ682	C 174, 175	ECEA1HS010	Q 386, 387				
R 312	ERD25FJ562	R 412	ERD25FJ682	C 176, 177	ECEA1HS010	Q 388, 389				
R 313	ERD25TJ473	R 413	ERD25TJ473	C 178, 179	ECEA1HS010	Q 390, 391				
R 316, 317	△ ERD2FCJ4R7	R 414	ERD25FJ101	C 180, 181	ECEA1HS010	Q 392, 393				
R 318, 319	△ ERD25FJ681	R 415	ERD25FJ101	C 182, 183	ECQMIH224JZ	Q 394, 395				
R 320	△ ERX2ANJ8R2	R 416	ERD25FJ101	C 184, 185	ECEA1ES4R7	Q 396, 397				
R 321	△ ERD25FJ102	R 417	ERD25FJ102	C 186, 187	ECKD1H820K	Q 398, 399				
R 322	ERD25FJ103	R 418	ERD25FJ103	C 188, 189	ECEA1HS010	Q 400, 401				
R 323	ERD25TJ153	R 419	ERD25TJ153	C 190, 191	ECEA1ES4R7	Q 402, 403				
R 324	ERD25TJ683	R 420	ERD25TJ683	C 192, 193	ECQMIH103JZ	Q 404, 405				
R 325	ERD25FJ472	R 421	ERD25FJ472	C 194, 195	ECKD1H331KB	Q 406, 407				
R 326, 327	ERD25FJ103	R 422	ERD25FJ103	C 196, 197	ECFDD152KVY	Q 408, 409				
R 328	ERD25FJ272	R 423	ERD25FJ272	C 198, 199	ECFDD122KVY	Q 410, 411				
R 329	ERD25FJ101	R 424	ERD25FJ101	C 200, 201	ECEA1ES4R7	Q 412, 413				
R 330	ERD25FJ103	R 425	ERD25FJ103	C 202, 203	ECKD1H681KB	Q 414, 415				
R 331	ERD25TJ104	R 426	ERD25TJ104	C 204, 205	ECEA1HS010	Q 416, 417				
R 332	ERD25TJ124	R 427	ERD25TJ124	C 206, 207	ECQMIH683JZ	Q 418, 419				
R 333	ERD25FJ100	R 428	ERD25FJ100	C 208, 209	ECQMIH154JZ	Q 420, 421				
R 334	ERD25FJ102	R 429	ERD25FJ102	C 210, 211	ECEA1ES4R7	Q 422, 423				
R 326, 327	ERD25FJ103	R 430	ERD25FJ103	C 212, 213	ECFDD152KVY	Q 424, 425				
R 328	ERD25FJ272	R 431	ERD25FJ272	C 214, 215	ECFDD103MF	Q 426, 427				
R 329	ERD25FJ101	R 432	ERD25FJ101	C 216, 217	ECQMIH472JZ	Q 428, 429				
R 330	ERD25FJ103	R 433	ERD25FJ103	C 218, 219	ECEA1HS010	Q 430, 431				
R 331	ERD25TJ104	R 434	ERD25TJ104	C 220, 221	ECEA1ES4R7	Q 432, 433				
R 332	ERD25TJ124	R 435	ERD25TJ124	C 222, 223	ECQMIH103JZ	Q 434, 435				
R 333	ERD25FJ100	R 436	ERD25FJ100	C 224, 225	ECQMIH154JZ	Q 436, 437				
R 334	ERD25FJ102	R 437	ERD25FJ102	C 226, 227	ECEA1ES4R7	Q 438, 439				
R 326, 327	ERD25FJ103	R 438	ERD25FJ103	C 228, 229	ECKD1H681KB	Q 440, 441				
R 328	ERD25FJ272	R 439	ERD25FJ272	C 230, 231	ECQMIH472JZ	Q 442, 443				
R 329	ERD25FJ101	R 440	ERD25FJ101	C 232, 233	ECEA1HS010	Q 444, 445				
R 330	ERD25FJ103	R 441	ERD25FJ103	C 234, 235	ECQMIH104JZ	Q 446, 447				
R 331	ERD25TJ104	R 442	ERD25TJ104	C 236, 237	ECQMIH683JZ	Q 448, 449				
R 332	ERD25TJ124	R 443	ERD25TJ124	C 238, 239	ECQMIH154JZ	Q 450, 451				
R										

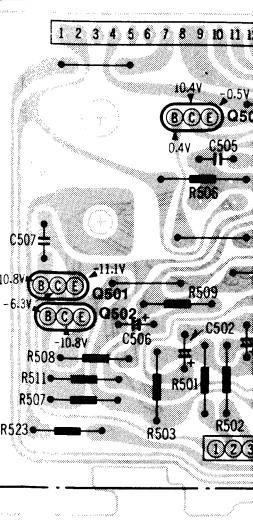
CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

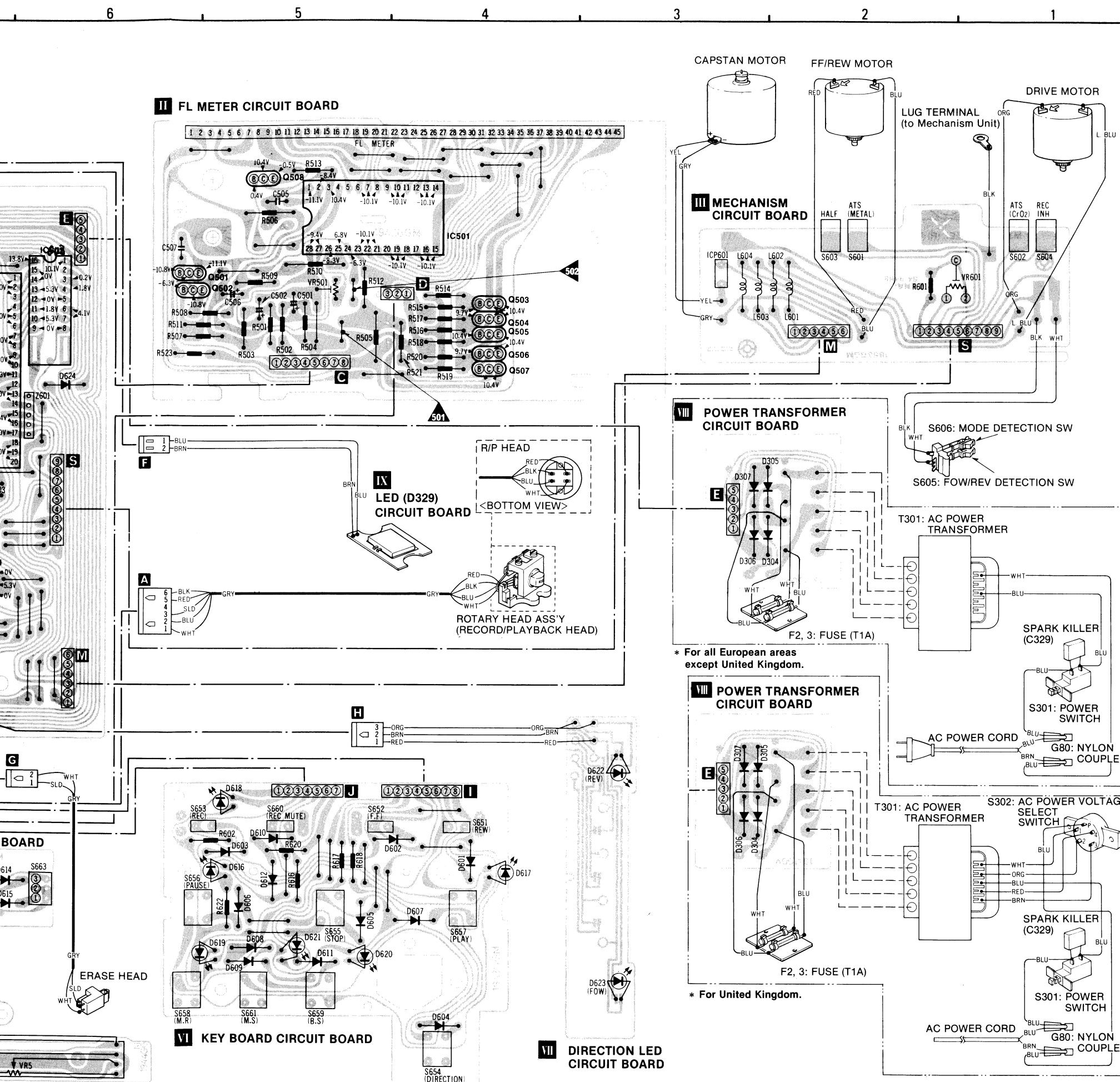
CONNECTION OF A FLAT CABLE

Connect the flat cable to the jumper socket so that the white line on the flat cable corresponds to the band mark side of the connection symbol (yellow or white symbol on the PC board) for the jumper socket. (This connection may differ from those for conventional models.)



II FL METER CIRCUIT

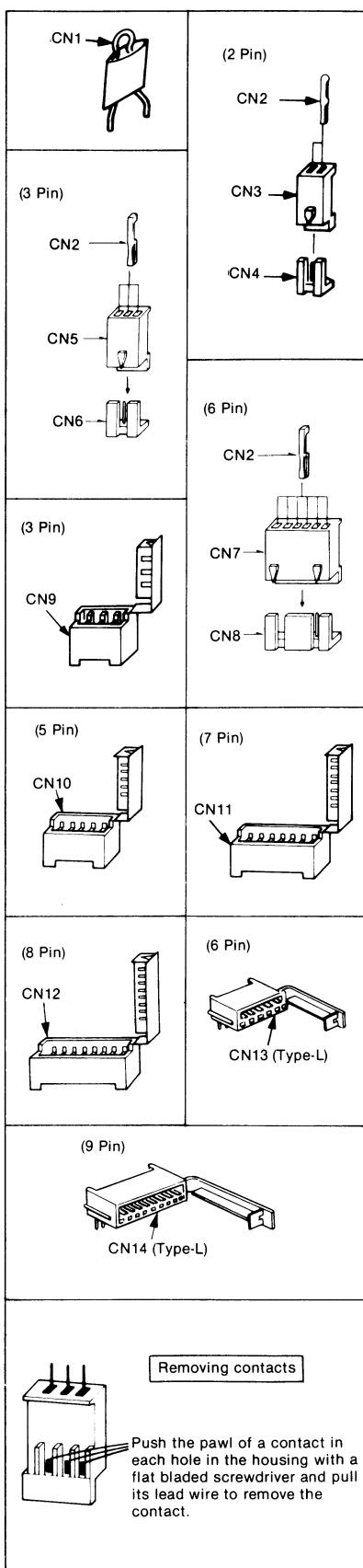




TERMINATIONS

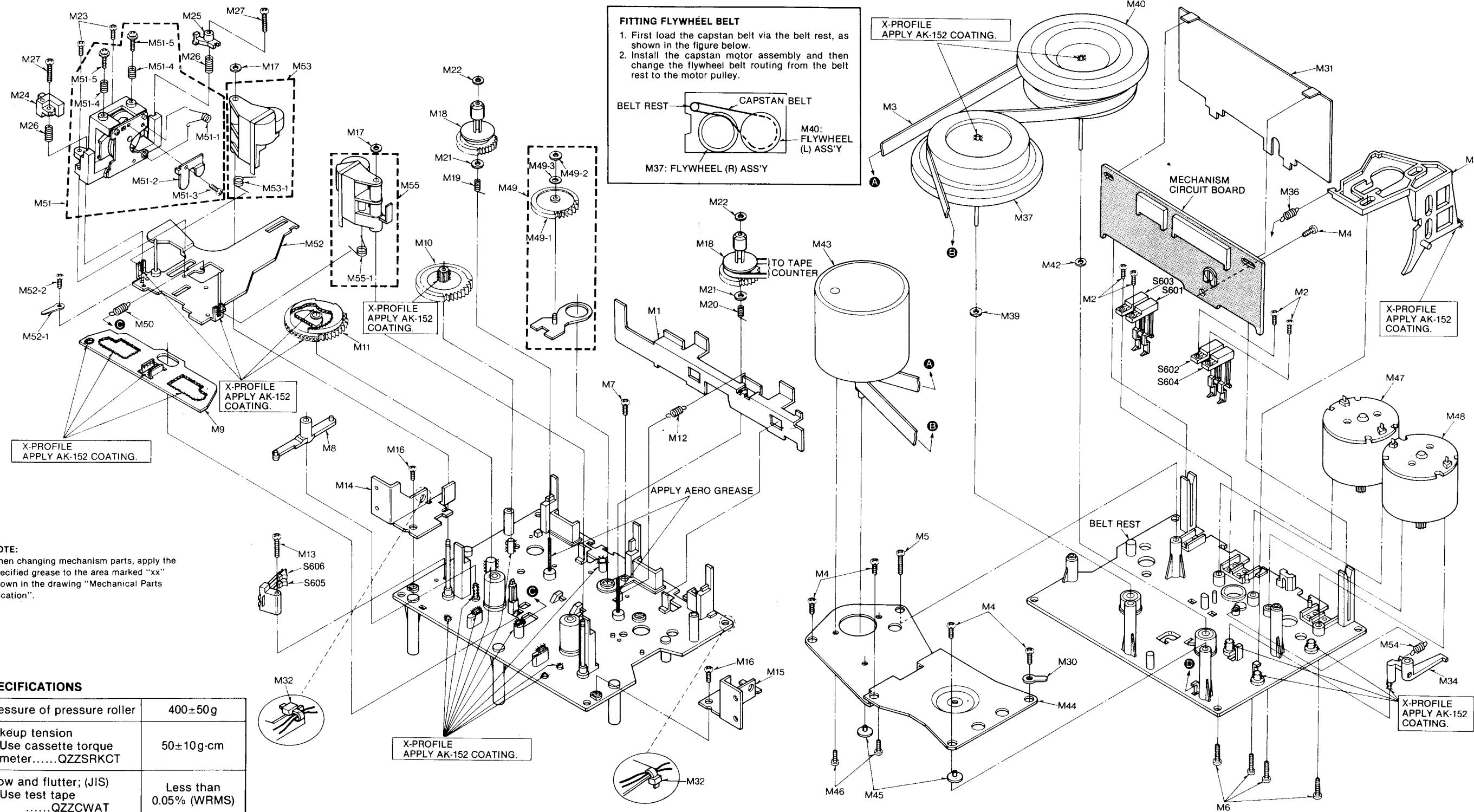
IC2, 7, 11, 12, 301, 302	IC9, 10	IC8
IC602, 603	IC601	IC5, 6
Q1—3, 23, 24, 301—303, 315	Q2, 3—31—34	Q306—308
Q4—6, 9—22, 25—30, 35—42, 304, 305, 309, 310, 312—314, 316—332, 501—508, 601—605	Q7, 8, 31—34	D5, 302
D301	D303—307	L5, 6
L301, MPX1, 2	L1, 2	D1, 3, 4, 6, 308—328, 601—612, 614, 615
D616—618	D619—621	L7, 601
		IC1
		IC501

CONNECTORS

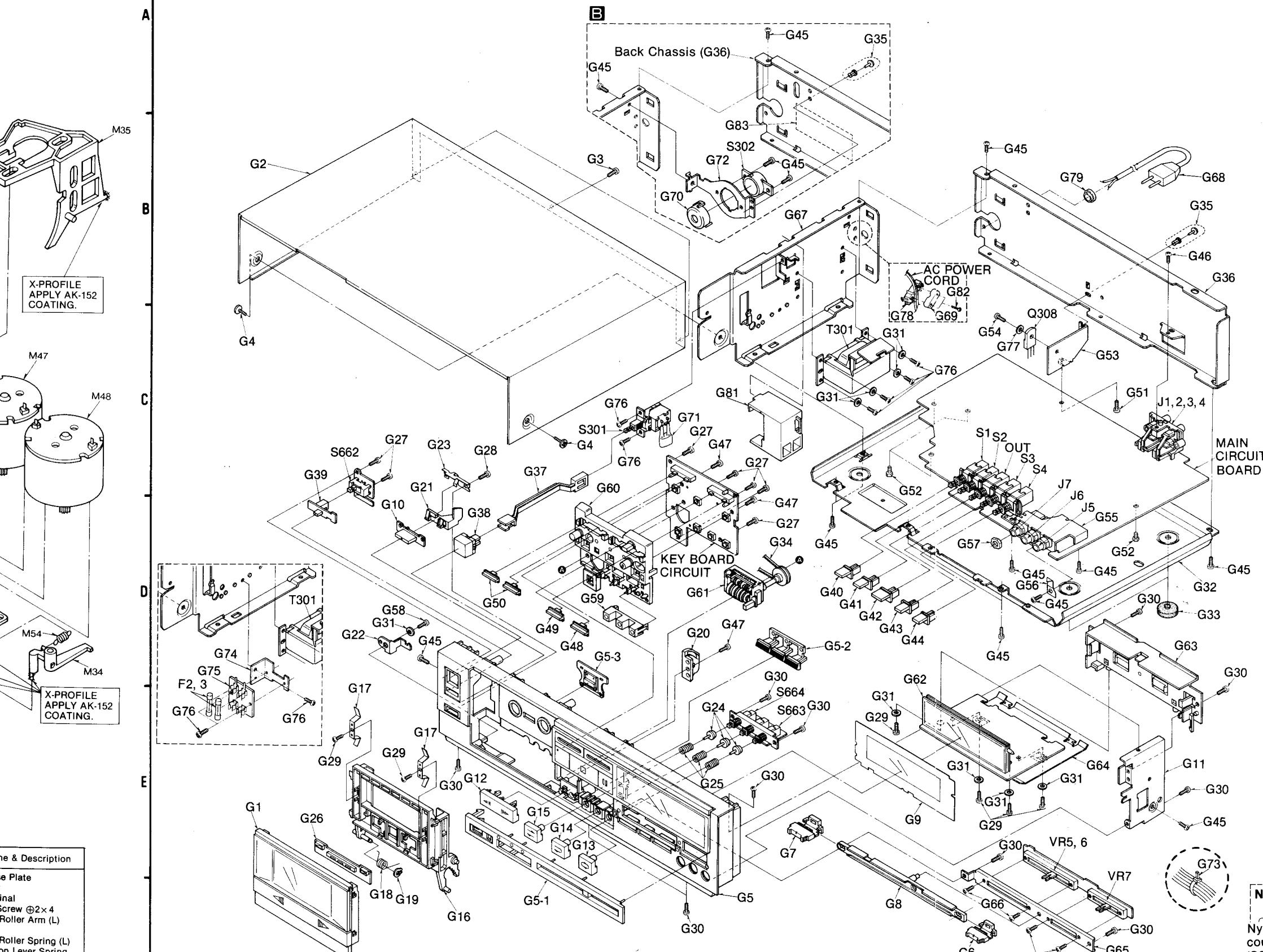


MECHANICAL PARTS LOCATION

CABINET



CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

Important safety notice
Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Part Name & Description
----------	----------	-------------------------

CABINET PARTS

G 1	QYF0700 "Silver Type" "Black Type"	Cassette Lid Assembly
G 2	QGC1245 "Silver Type" "Black Type"	Case Cover
G 3	XTB3+8BFN "Silver Type" "Black Type"	Tapping Screw $\oplus 3 \times 8$
G 4	QHQ1349 "Silver Type" "Black Type"	Ornament Screw
G 5	QYP1215S "Silver Type" "Black Type"	Front Panel Assembly
G 6	QGO2308 refer to D329 QYT0657	Function Button Assembly
G 7	QYT0658	Input Level Control Knob Assembly
G 8	QGG0227	Slide Guide
G 9	QGL1189 "Silver Type"	Meter Filter
G 10	QGO2306	Eject Button
G 11	QMA4636	Side Angle-R
G 12	QGO2309 "Silver Type"	Direction Button
G 13	QGO2309K "Black Type"	Mode Select Button-A
G 14	QGO2315 "Silver Type"	Mode Select Button-A
G 15	QGO2315K "Black Type"	Mode Select Button-B
G 16	QGO2316 "Silver Type"	Mode Select Button-B
G 17	QGO2316K "Black Type"	Mode Select Button-C
G 18	QGO2317K "Black Type"	Mode Select Button-C
G 19	QYF0697S	Cassette Holder Assembly
G 20	QYF0697K "Black Type"	Cassette Holder Assembly
G 21	QB1925	Holder Spring
G 22	QBN1961	Eject Spring
G 23	XUB04FT	Stop Ring 4 ϕ
G 24	QYF0627	Dumper Gear Assembly
G 25	QML4063	Eject Lever
G 26	QMA4626	Holder Angle-L
G 27	QBP2007	Eject Lever Spring
G 28	QMB1429	Button Bushing
G 29	QBC1473	Reverse Mode Button Spring
G 30	refer to D622 & D623	FOWIREV LED
G 31	XTN3+6B	Tapping Screw $\oplus 2.6 \times 6$

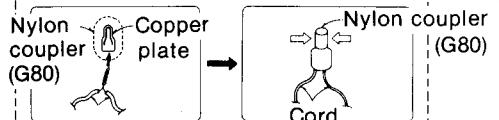
ACCESSORIES

A 1	QEB0125	Connection Cord
A 2	QQT3571	Instruction Book

PACKINGS

P 1	QPN4514	Inside Carton
P 2	QPA0701	Cushion-R
P 3	QPA0702	Cushion-L
P 4	QPS0434	Pad
P 5	QPA0712	Spacer
P 6	XZB40X60A02	Poly Sheet (for UNIT)
P 7	QPC0072	Poly Sheet (for AC Power Cord)

Note: Cord connection using this nylon coupler (G80) requires a special tool.



- NOTES:
D..... For all European areas except United Kingdom.
B..... For United Kingdom.